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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

CARL ELMER ALLEN

FOR THE

Robt. Wm. Maxwell
H. A. Stearns
F. Weaver

Professor Hiram T. Scovill
Professor Nathan A. Weston

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

CARL ELMER ALLEN

FOR THE

Degree of Doctor of Philosophy

Tuesday, May 27, 1930, 3 p. m.
Room 212 Commerce Building

THE L
MAY 24 1930
UNIV

Committee in Charge:

- Professor Maurice H. Robinson, Chairman
- Professor Merlin H. Hunter
- Professor Frederic E. Lee
- Professor Hiram T. Scovill
- Professor Nathan A. Weston

OUTLINE OF STUDIES

Major Subject: Economics
Minor Subject: Accountancy

Thesis: THE FINANCING OF AMERICAN AUTOMOBILE MANUFACTURING COMPANIES

SUMMARY

The initial capital in the early automobile companies came from two sources, first from the meager savings of the inventors and their few backers; and second, from the accumulated capital of those industries taking over the making of the new product. This initial capital which was generally limited in amount, was economized by the purchase of materials and parts on credit, by selling the finished product for cash, and by requiring dealers to make deposits on orders. However, the amount of capital obtained from these sources was not large enough to finance the rapid expansion made necessary by the constant increase in demand for automobiles. As it was extremely difficult to raise outside capital, the manufacturer was practically forced to finance this expansion largely out of earnings. A study of the sources of capital in seventeen automobile manufacturing companies shows that in 1928 about 62 per cent of their total assets consisted of earnings that had been retained in the business. A further study of 419 balance sheets of automobile companies from the years 1910 to 1928 shows that the relative amount of capital secured through common stockholders' contributions has increased generally during these years, and that the relative amount obtained through the use of preferred stocks and bonds has decreased during this period. A separate study of large organizations reveals that these have had a great influence upon this trend in financing. These changes in the methods of securing capital during this nineteen year period may be accounted for as follows: First, conditions in the automobile industry has been such that conservative financing has been of fundamental importance. Second, unprofitable experience, especially in times of stress, by companies using long term obligations have made them less desirable. General changes in style of financing have made it easier for automobile companies to secure capital through common stock rather than through long term obligations. Large profits in the automobile industry have encouraged the common stockholder to leave a large proportion of his earnings in the business.

EDUCATIONAL CAREER

B.S., University of Illinois, 1923

M.S., University of Illinois, 1925

Assistant and Instructor in Accountancy,
University of Illinois, 1924-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

RUTH ANDERSON

FOR THE

Degree of Doctor of Philosophy

Wednesday, May 28, 1930, 10 a. m.
Room 108 Administration Building

THE
MAY 24
UNIV

Committee in Charge:

Professor Charles Zeleny, Chairman
Professor Leverett A. Adams
Professor Charles F. Hottes
Professor Waldo Shumway
Professor Harley J. Van Cleave
Professor Henry B. Ward

OUTLINE OF STUDIES

Major Subject: Zoology (Genetics)
First Minor Subject: Invertebrate Zoology
Second Minor Subject: Botany

Thesis: THE SOMATIC EFFECTS OF UNIT HEREDITARY FACTORS UNDER CONSTANT ENVIRONMENTAL CONDITIONS

Summary

1. The unit factor under consideration is that of the "bar" eye of Drosophila melanogaster. This was studied by means of full-eyed reversions and ultra-bar mutants in two strains—one with straight bristles, and one in which the bristles were forked. A constant temperature of 27° was used.

2. It was found that the primary effect of the bar gene is a reduction in facet number to approximately 16% of the original number found in the full-eyed type; and that the ultra bar gene again reduces the facet number to about 16% of that found in bar.

3. In addition to the reduction in facet number there is a graded decrease in the size of the flies of the bar and ultra-bar stocks as compared to the full.

4. This size difference is most noticeable in the head width, thoracic length, wing length, circumocular hairs and median ocellus.

5. A difference of the same order but to a lesser degree is found in the wing width and haltere length.

6. In contrast to the decrease in size, the number of rows of acrostical hairs is increased slightly and that of the ocellar bristles to a marked degree.

7. The observations made on the straight-bristled stock are correlated with those of the forked strain.

8. On the whole the forked strain flies are somewhat smaller than the straight-bristled ones.

9. The only exception to this statement is a slight increase in the forked ultra stock over the straight in the haltere length of the males and in the thoracic length of both sexes.

10. The most pronounced difference between the two strains is the reduction of circumocular hairs in the forked strain.

EDUCATIONAL CAREER

A.B., University of Missouri, 1921

A.M., Columbia University, 1922

Assistant in Zoology, University of Illinois, 1923-1924

Fellow in Zoology, University of Illinois, 1924-1925

Associate in Zoology, University of California, Los Angeles, 1925-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

ROBERT WILLIAM BALL

FOR THE

Degree of Doctor of Philosophy

Monday, August 4, 1930, 3 p. m.
Room 162, Chemistry Building

THE LIBRARY OF THE
20 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

Professor Leonard F. Yntema, Chairman
Professor George L. Clark
Professor Duane T. Englis
Professor B. Smith Hopkins
Professor Charles T. Knipp

OUTLINE OF STUDIES

Major Subject: Chemistry (Inorganic)

First Minor Subject: Analytical Chemistry

Second Minor Subject: Physics

Thesis: OBSERVATIONS ON THE RARE EARTHS:

I. STUDIES IN THE PREPARATION OF METALLIC NEODYMIUM

II. THE SEPARATION OF YTTERBIUM BY ELECTROLYTIC REDUCTION

SUMMARY

1. Reduction of neodymium compounds with metals did not give pure metallic neodymium. Electrolysis of neodymium chloride was unsatisfactory. Electrolysis of neodymium fluoride and of neodymium salts in neodymium fluoride gave metallic neodymium.

2. Electrolysis in the presence of the sulfate ion of soluble and rare earth chlorides which contained approximately 2 per cent ytterbium gave a precipitate of more than 98 per cent ytterbium as shown by spectrum analysis.

3. Bivalent ytterbium sulfate may be precipitated from an acid solution by electrolytic reduction in the presence of the sulfate ion. Analysis of the precipitate showed it to be of variable composition. It was soluble in dilute acids with the evolution of hydrogen and in nitric acid with evolution of oxides of nitrogen.

4. The ytterbous ion, Yb^{++}, was green in color.

EDUCATIONAL CAREER

B.A., University of British Columbia, 1925

M.A., Universiy of British Columbia, 1927

Assistant in Chemistry, University of British Columbia, 1925-1927

Assistant in Chemistry, University of Illinois, 1927-1929

Illinium Research Assistant, University of Illinois. 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

CHESTER WALLACE BENNETT

FOR THE

Degree of Doctor of Philosophy

Monday, May 26, 1930, 2 p. m.
Room 456 Chemistry Building

THE LIBRARY OF THE
MAY 24 1930

Committee in Charge:

- Professor Roger Adams, Chairman
- Professor Carl S. Marvel
- Professor William A. Noyes
- Professor Fred W. Tanner
- Professor Leonard F. Yntema

OUTLINE OF STUDIES

Major Subject: Chemistry (Organic)
Minor Subject: Bacteriology

Thesis: ATTEMPTS TO PREPARE OPTICALLY ACTIVE ALIPHATIC AND ALICYCLIC DIAZO COMPOUNDS

SUMMARY

1. Attempts to prepare 9–diazofluorene carboxylic acid were unsuccessful.

2. The ketazines of levulinic acid and of its hydrazide were obtained instead of the hydrazones expected.

3. A new stable alicyclic diazo amine, 2–amino–9–diazofluorene, was prepared.

4. A new synthesis for 2, 9–diaminofluorene was developed. Neither this compound nor 2–amino–9–hydroxyfluorene could be resolved.

5. The failure to resolve any 2, 9–fluorene compound may be due to a lack of asymmetry or to the fact that the right conditions have not been found. In any case, the failure to resolve 2–amino–9–diazofluorene does not demonstrate that the carbon atom bearing the diazo group is not asymmetric.

6. The diazo compound could not be isolated from p–aminobenzophenone hydrazone, the synthesis of which is described.

EDUCATIONAL CAREER

B.S., University of Illinois, 1926

M.S., Northwestern University, 1927

Graduate Assistant in Chemistry, Northwestern University, 1926-1927

Research Assistant in Chemistry, University of Illinois, 1927-1929

Assistant in Chemistry, University of Illinois, 1929-1930

PUBLICATIONS

The Ketazines of Levulinic Acid and of Levulinic Hydrazide.
J. Am. Chem. Soc. *50*, 1747-8 (1928).

With C. D. Hurd:

Concentration of Hydrazine Hydrate Solutions.
J. Am. Chem. Soc. *51*, 265-9 (1929).

The Pyrolysis of Benzaldehyde and of Benzyl Benzoate.
J. Am. Chem. Soc. *51*, 1197-9 (1929).

The Decomposition of Methyl–2–hexanol–2.
J. Am. Chem. Soc. *51*, 3675-6 (1929).

With W. A. Noyes:

Optically Active Diazo Compounds IV. A Stable Alicyclic Diazo Amine.
Rec. trav. chim. *48*, 895-898 (1929).

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

LANGFORD TODD BOURLAND

FOR THE

Degree of Doctor of Philosophy

Monday, May 26, 1930, 4 p. m.
Room 201 Physics Laboratory

THE LIBRARY OF THE
MAY 24 1930

COMMITTEE IN CHARGE:

- PROFESSOR FRANCIS W. LOOMIS, Chairman
- PROFESSOR ROBERT D. CARMICHAEL
- PROFESSOR CHARLES T. KNIPP
- PROFESSOR JAKOB KUNZ
- PROFESSOR FLOYD R. WATSON
- PROFESSOR ELMER H. WILLIAMS

OUTLINE OF STUDIES

Major Subject: Physics
First Minor Subject: Mathematics
Second Minor Subject: Theoretical Physics

Thesis: THE MAGNETIC SUSCEPTIBILITIES OF OSMIUM, IRIDIUM AND PLATINUM

SUMMARY

A magnetic balance has been designed which possesses inherent advantages over the earlier types.

This balance has been used to measure the magnetic susceptibilities of osmium, iridium, and platinum, as functions of the temperature. An attempt was made to correlate these measurements with a theory of magnetism. Platinum was found to obey a Weiss law but gave a non-integral value of Weiss magnetons. The susceptibilities of osmium and iridium were found to increase with the temperature; this behavior is not satisfactorily explained by a known theory of magnetism.

In order to check the validity of the Hund rules for calculating the magnetic moments of ions from spectroscopic theory, the susceptibilities of iridium dioxide, platinous chloride and iridium chloride were measured. The data obtained did not agree with the Hund predictions.

EDUCATIONAL CAREER

B.S., University of Illinois, 1926

M.S., University of Illinois, 1928

Fellow in Physics, University of Illinois, 1928-1929, 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

LEONARD BRISTOW

FOR THE

Degree of Doctor of Philosophy

Wednesday, May 21, 1930, 4 p. m.
Room 254, Mathematics Building

THE LIBRARY OF THE
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UNIVERSITY OF ILLINOIS

Committee in Charge

Professor Robert D. Carmichael, Chairman
Professor Arthur B. Coble
Professor Jakob Kunz
Professor Alfred J. Maria
Professor George A. Miller

OUTLINE OF STUDIES

Major Subject: Mathematics
Minor Subject: Physics

Thesis: EXPANSION THEORY ASSOCIATED WITH LINEAR DIFFERENTIAL EQUATIONS AND THEIR REGULAR SINGULAR POINTS

SUMMARY

The differential equation is taken in the form

$$x^{n-1} y^{(n)} + x^{n-2} \alpha y^{(n-1)} + x^{n-3} \rho_2(x) y^{(n-2)} + \cdots + \frac{\rho_n(x) y}{x} + \frac{\lambda y}{x} = 0$$

where $\rho_2(x), \ldots\ldots, \rho_n(x)$ are analytic functions of the complex variable x at $x = 0$. The problem is set up as a boundary value problem. Suitable boundary conditions are determined together with characteristic values of λ. An expansion of $(t-x)^{-1}$ is obtained in a series of the solutions of the differential equation with argument x. The coefficients are polynomials in t^{-1} which are associated with a corresponding solution of the adjoint equation. By means of Cauchy's theorem there is obtained the expansions of (a) an arbitrary function analytic at the origin; (b) an arbitrary function analytic in an annular ring; (c) an arbitrary function of more than one complex variable analytic in suitable regions. The expansions converge absolutely and uniformly with respect to x in regions bounded by circles.

EDUCATIONAL CAREER

A.B., Colorado College, 1926

A.M., University of Illinois, 1927

Scholar in Mathematics, University of Illinois, 1926-1927

Fellow in Mathematics, University of Illinois, 1927-1928, 1929-1930

Assistant in Mathematics, University of Illinois, 1928-1929

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION
OF
EUGENE BROWNING
FOR THE
Degree of Doctor of Philosophy

Saturday, August 9, 1930, 10 a.m.
Room 162 Chemistry Building

THE LIBRARY OF THE
0 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

- Professor Roger Adams, Chairman
- Professor George L. Clark
- Professor Reynold C. Fuson
- Professor Charles T. Knipp
- Professor Worth H. Rodebush

OUTLINE OF STUDIES

Major Subject: Chemistry (Organic)
First Minor Subject: Physical Chemistry
Second Minor Subject: Physics

Thesis: I. STEREOCHEMISTRY OF DIPHENYL BENZENES. THE PREPARATION OF STEREOISOMERIC 3, 6–DI–(2, 4–DIMETHYLPHENYL)–2, 5–DIBROMOHYDROQUINONES AND THEIR DERIVATIVES

Summary

1. Two stereoisomeric 3, 6–di–(2, 4–dimethylphenyl)–2, 5–dibromohydroquinones and their diacetyl and tetranitro derivatives have been prepared.

2. These substances have been shown to be the racemic and meso modifications of derivatives of terphenyl having three different ortho substituents in each set of four positions existing adjacent to the linkages between the benzene rings.

3. It has been concluded that the same conditions which cause optical isomerism in the diphenyl series also exist in the terphenyl series.

4. (Addenda) Unsuccessful attempts have been made to prepare trimesitylchloromethane, an intermediate product for the preparation of derivatives of tetramesitylmethane which would be expected to be stereoisomeric.

Part II. THE PREPARATION AND BACTERIOLOGICAL ACTION TOWARD *B. LEPRAE* OF CERTAIN OLEFINIC ACIDS

1. Various undecylenyl alkyl acetic acids and α, β–unsaturated dialkyl acetic acids have been prepared and tested for bactericidal action toward *B. leprae*.

2. The unsaturated acids appear to be of about the same bactericidal value as the corresponding saturated acids.

EDUCATIONAL CAREER

B.S., Illinois Wesleyan University, 1926

M.S., University of Illinois, 1927

Assistant in Chemistry, University of Illinois, 1926-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

QUINCY GUY BURRIS

FOR THE

Degree of Doctor of Philosophy

Saturday, May 24, 1930, 9 a. m.
Room 108 Administration Building

THE LIBRARY OF THE
MAY 24 1930

Committee in Charge:

- Professor Ernest Bernbaum, Chairman
- Professor Thomas W. Baldwin
- Professor George T. Flom
- Professor Walter Graham
- Professor Harry S. V. Jones
- Professor Matthew T. McClure
- Professor Jacob Zeitlin

OUTLINE OF STUDIES

Major Subject: English
First Minor Subject: English Philology
Second Minor Subject: Philosophy

Thesis: RICHARD DODDRIDGE BLACKMORE: HIS LIFE AND NOVELS

Summary

1. Contrary to the assumption that Blackmore was an unsocial man by nature, a study of his character seems to show that he was a social person, made shy and reticent by his fear of epileptic attacks, though genial and kindly when sought out.

2. Analysis of his novels shows that his three main interests, in fiction as in life, were these: simple pastoral scenes; simple people, living a quiet life; and the romance of these people in their love-time.

3. Thorough consideration of his reading, and what it is reasonable to assume that he might have read, shows us that, although there are some slight bases for comparison, there is nothing to lead one to the belief that his work can be traced to definite literary progenitors.

4. Rather one must conclude, after having reviewed the origins of his materials, that he took much of his fiction from the actual scenes, characters, and incidents of his own experience.

5. Since it is not possible to understand Blackmore's place in Victorian fiction by the historical method, I have employed the comparative method, which shows that, though Blackmore used many of the materials employed by his predecessors and contemporaries, he combined them in a fashion which pleased the Victorian reader, and which that reader could not find elsewhere in the fiction to which he had access.

EDUCATIONAL CAREER

A.B., University of Illinois, 1924

A.M., University of Illinois, 1927

Assistant in English, University of Illinois, 1925-1929

Fellow in English, University of Illinois. 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

CHUNG CHIN TIEN

FOR THE

Degree of Doctor of Philosophy

Wednesday, May 28, 1930, 9:30 a. m.
Room 424A Library Building

THE LIBRARY
MAY 24 1930

Committee in Charge:

Professor John A. Fairlie, Chairman
Professor Clarence A. Berdahl
Professor Frederick C. Dietz
Professor James W. Garner
Professor Ernest T. Hiller
Professor John M. Mathews

OUTLINE OF STUDIES

Major Subject: Political Science
First Minor Subject: International Law
Second Minor Subject: Sociology

Thesis: STATE SUPERVISION OVER MUNICIPAL FINANCE IN ENGLAND AND THE UNITED STATES

Summary

Complete local independence and absolute centralization has either destroyed national welfare or discouraged local initiative in the past, but central supervision and local self-government co-exist in the present civilized countries. The methods of state supervision over local government are generally divided into two classes: (1) legislative supervision; (2) administrative supervision. The former prevails in England and the United States and the latter in continental Europe and in some other countries. But recently on account of changing economic and social conditions and the growth of municipalities, both England and the United States are changing their central supervision over local governments from legislative to administrative. This thesis chooses one of these changing aspects, viz: "state supervision over municipal finance" for intensive study, in order to discover what kind of state supervision is more advisable and desirable. As the first step, the historical development of state supervision over municipal finance in these two countries are traced. Then state supervision over municipal revenue, expenditure, accounts and indebtedness at the present time are discussed. The final conclusion is that constitutional restrictions over municipal finance in the United States are unsatisfactory. Statutory restriction in England is much better than in the United States. Administrative supervision over municipal assessment is much better in the United States than in England. But there is need for further improvement. Central audit of municipal accounts desirable in both of these countries. The English system is even more advisable. But England ought to extend such audit to the general accounts of the boroughs, and the United States ought to extend such systems to every state. Administrative approval and review of municipal budget-making and debt-incurring are justified in checking local extravagance and corruption but are not desirable when this interferes with local policy. The advisory and coordinating functions of the central authorities of these two countries, as in collecting financial information, publishing financial statistics, and giving assistance to local authorities in tax assessment and keeping accounts, are new and valuable contributions in the supervision over municipal finance.

EDUCATIONAL CAREER

B.A., Peking National University, 1923
A.M., University of Illinois, 1927

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

DONALD DRAKE COFFMAN

FOR THE

Degree of Doctor of Philosophy

Friday, May 23, 1930, 10 a. m.
Room 176 Chemistry Building

THE LIBRARY OF THE
MAY 24 1930

Committee in Charge:

Professor Carl S. Marvel, Chairman
Professor Thomas E. Phipps
Professor Ralph L. Shriner
Doctor Leonard L. Steimley
Professor Leonard F. Yntema

OUTLINE OF STUDIES

Major Subject: Chemistry (Organic)
First Minor Subject: Physical Chemistry
Second Minor Subject: Mathematics

Thesis: I. THE REACTIONS OF ALKALI METAL ALKYLS WITH QUATERNARY PHOSPHONIUM SALTS
II. THE SYNTHESIS OF TRINONDECINYLCARBINOL

Summary

1. Alkali metal alkyls react with quaternary phosphonium halides at room temperature.

2. Tetra-ethylphosphonium iodide and sodium triphenyl-methyl give at once colorless products and the reaction is apparently analogous to that between alkali metal alkyls and quaternary ammonium and arsonium salts.

3. Triphenylalkylphosphonium halides react with alkali metal alkyls to give as primary products of the reaction colored compounds apparently identical with the phosphine-methylenes of Staudinger. The products isolated from several different reactions of this type are easily explained as decomposition products of the intermediate phosphine-methylenes.

4. The evidence obtained leads to the conclusion that the fifth valence of phosphorus in quaternary phosphonium halides preserves its distinctive character even under circumstances most propitious for its relinquishment, and that an alkyl group may not act as a stable ion while united to the phosphonium group by a polar valence.

5. The following compounds have been prepared and described: 2-bromonondecene-I, nondecine-I, and trinondecinylcarbinol. Derivatives of the latter have been prepared.

EDUCATIONAL CAREER

B.S., University of Illinois, 1927

M.S., University of Wisconsin, 1928

Assistant in Chemistry, University of Wisconsin, 1927-1928

Fellow in Chemistry, University of Illinois, 1928-1929

DuPont Fellow in Chemistry, University of Illinois, 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

ELIZABETH MORGAN COOPER

FOR THE

Degree of Doctor of Philosophy

Thursday, May 22, 1930, 4 p. m.
Room 254 Mathematics Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

- Professor Arthur B. Coble, Chairman
- Professor Robert D. Carmichael
- Professor Charles T. Knipp
- Professor Harry Levy
- Professor George A. Miller

OUTLINE OF STUDIES

Major Subject: Mathematics (Geometry)
First Minor Subject: Analysis
Second Minor Subject: Physics

Thesis: PERSPECTIVE ELLIPTIC CURVES

SUMMARY

Two curves in a plane, the one a locus of points and the other an envelope of lines, are said to be perspective if they can be put into one to one correspondence in such a way that corresponding point and line are incident. Two such curves have, necessarily, the same genus. Though much work has already been done with perspective rational curves, the elliptic case has apparently not heretofore been handled. It is more difficult to deal with than the binary case because of complications introduced by the use of the addition formula for the Weierstrasse $\wp$–function in connection with the parameter transformation, $v' = \pm v + \kappa$. In the expressions giving the coördinates, factors are brought in which cannot be isolated and which necessitate tedious methods of treatment.

In this paper the family of cubics perspective to a given cubic has been obtained, and certain theorems have been proved for their case which it is hoped can be extended to the general case of m–ics perspective to a given n–ic. One such general theorem has been proved and, in the case of another, the progress made in an attempted proof is shown.

EDUCATIONAL CAREER

A.B., Radcliffe College, 1913

A.M., Bryn Mawr College, 1923

Assistant in Mathematics, University of Illinois, 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

STEPHEN MAXWELL COREY

FOR THE

Degree of Doctor of Philosophy

Tuesday, May 13, 1930, 10 a. m.
Room 108 Administration Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

Professor Coleman R. Griffith, Chairman
Professor Edward H. Cameron
Professor Walter S. Monroe
Professor Charles W. Odell
Professor Robert F. Seybolt
Professor Herbert Woodrow

OUTLINE OF STUDIES

Major Subject: Education
First Minor Subject: Educational Psychology
Second Minor Subject: Psychology

Thesis: THE RELATIONSHIP BETWEEN COMPULSORY PHYSICAL EXERCISE AND THE ABILITY OF THE WHITE RAT TO LEARN AND RELEARN AN ELEVATED SKELETON MAZE

SUMMARY

Studies of the effect of physical exercise on the higher mental functions have been limited to a comparison of the grades of athletes and non-athletes. Because of the difficulty of controlling pertinent factors in such studies, the present investigation is experimental rather than statistical. Animal subjects (white rats) were employed to make possible a more adequate control of motivation.

Each experimental group, of which there were three, had its own control consisting of animals from the same litters. The groups were compared with respect to the four criteria of speed of learning commonly used in such studies, namely, errors, time, active time, and trials. Before experimentation started every effort was made to equate the two groups with respect to all factors save physical exercise. Learning ability was tested by having the subjects solve an eight cul-de-sac elevated maze. The exercise was imposed by running the experimental animals in a rotating wire cage electrically operated. The control animals were given no added opportunity for exercise other than that offered in the nest cages.

Although the exercised subjects were slightly superior with respect to most of the criteria of speed of learning, their superiority was in no instance statistically significant. Physical exercise had no pronounced effect upon the ability of the white rat to learn or relearn an elevated skeleton maze under the conditions of this study.

EDUCATIONAL CAREER

B.S., Eureka College, 1926

M.A., University of Illinois, 1927

Scholar in Education, University of Illinois, 1926-1927

Fellow in Education, University of Illinois, 1927-1928

Instructor in Education, University of Illinois, 1928-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

MARTIN ELI CUPERY

FOR THE

Degree of Doctor of Philosophy

Tuesday, May 20, 1930, 9 a. m.
Room 456 Chemistry Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

Professor Roger Adams, Chairman
Professor George L. Clark
Professor Reynold C. Fuson
Professor John H. Reedy
Professor William C. Rose
Professor Fred W. Tanner

OUTLINE OF STUDIES

Major Subject: Chemistry (Organic)
First Minor Subject: Physiological Chemistry
Second Minor Subject: Bacteriology

Thesis: I. THE SYNTHESIS OF FIVE AMINO ACIDS. II. A STUDY OF THE STEREOISOMERISM OF THE DIPHENYL SERIES.

Summary

Part I.

Five α-amino acids were prepared from compounds having a known bactericidal action toward Mycobacterium leprae. An original procedure was developed for a more satisfactory synthesis of certain of these new derivatives. It was found that amino acids of the type prepared were too insoluble for practical usage.

Part II.

Certain tetraorthomethoxydiphenyl derivatives were synthesized which will be of value in the study of the stereoisomerism of the diphenyl series of compounds. In the course of these investigations the structure of nitroresacetophenone was established by the preparation of a systematic series of interrelated derivatives. A study of the Ullmann reaction led to improvements in the synthesis of 2, 4, 6, 2′, 4′,-6′–hexanitrodiphenyl, as well as the original synthesis of 2, 4, 6, 2′–tetranitrodiphenyl. By means of an improved series of reactions, tetraorthomethoxydiphenyl was prepared in satisfactory yields. A modified Friedel Crafts reaction was adapted to the synthesis of 3, 3′–diaceto, 2, 2′, 6, 6′–tetramethoxy, diphenyl. The mono-aceto and tetra-aceto derivatives of tetramethoxydiphenyl were also prepared.

EDUCATIONAL CAREER

A.B., Hope College, 1924

M.S., Massachusetts Agricultural College, 1926

Assistant in Chemistry, Massachusetts Agricultural College, 1924-1926

Assistant in Chemistry, University of Illinois, 1926-1928

Instructor in Chemistry, Massachusetts Agricultural College, 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

WALKER MYRICK DAWSON

FOR THE

Degree of Doctor of Philosophy

Tuesday, May 27, 1930, 8 a. m.
Room 331, New Agriculture

THE LIBRARY OF THE
MAY 24 1930
[illegible]

Committee in Charge:

- Professor Henry P. Rusk, Chairman
- Professor Maxwell J. Dorsey
- Professor Harold H. Mitchell
- Professor Waldo Shumway
- Professor Clyde M. Woodworth
- Professor Charles Zeleny

OUTLINE OF STUDIES

Major Subject: Animal Husbandry
Minor Subject: Plant Breeding

Thesis: INHERITANCE OF WILDNESS AND TAMENESS IN MICE

SUMMARY

The inheritance of wildness and tameness in mice was studied by making appropriate crosses and measuring the degree of wildness exhibited by means of tests devised for that purpose. The terms wildness and tameness were thought of as describing the reactions of the individual to external stimuli which caused fear.

Three methods of measuring wildness were used: (1) the runway test, (2) the shock test, and (3) the revolving cage test.

The mice were tested at weekly intervals after reaching 75 days of age.

The runway test proved to be the most accurate method of testing used. There was, in this test, a wide difference between the wild and tame strains with very little overlapping between them. The tame mice were much more variable than the wild. Wild proved to be almost completely dominant to tame in the F_1. Reciprocal crosses showed no significant difference. Both parental types were reobtained in the F_2 in a population of 365. Backcrosses to the wild gave offspring intermediate between the F_1 and wild parents. Backcrosses to the tame gave offspring intermediate between the F_1 and tame parents. Selection in the wild stock for wildness had no effect in four generations, while selection in the tame stock for tameness increased the average tameness of the mice to a considerable extent in four generations. Evidence of some heterozygosity in the tame parent was obtained in the results from the backcrosses and selection in the tame stock. The tame mice were probably heterozygous for modifying genes, otherwise they would have appeared wild. It was estimated that two or three genes were responsible for the greater part of the difference between the wild and tame mice used.

EDUCATIONAL CAREER

B.S., University of Maryland, 1925

M.S., University of Illinois, 1926

Scholar in Animal Husbandry, University of Illinois, 1925-1926

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

BURRUS SWINFORD DICKINSON

FOR THE

Degree of Doctor of Philosophy

Friday, May 23, 1930, 3 p. m.
Room 209, Commerce Building

THE LIBRARY OF THE
MAY 24 1930

Committee in Charge:

Professor Edward Berman, Chairman
Professor Ernest Bernbaum
Professor Merlin H. Hunter
Professor Maurice H. Robinson
Professor Nathan A. Weston

OUTLINE OF STUDIES

Major Subject: Economics
Minor Subject: English

Thesis: THE NEWSPAPER AND LABOR. AN INQUIRY INTO THE NATURE AND INFLUENCE OF LABOR NEWS AND COMMENT IN THE DAILY PRESS

SUMMARY

The average amount of labor news in many metropolitan newspapers is about 1000 words per day, of which nearly half deals with disputes. The nature of the news mechanism causes information concerning strikes, violence, and racketeering to overshadow more significant aspects of labor affairs, such as unemployment, wage standards, and working conditions. While labor news is at times inaccurate, the errors are usually unintentional, and remedial influences are in operation. Editorial comment usually favors the interests of the working classes as a whole, and is hostile to trade unions only when violence occurs or when specific aims of unions are considered contrary to the public interest. News of such phases of unionism as racketeering and violence undermines public confidence, but other material partially neutralizes this unfavorable influence. The press tends to discourage strikes, and at times the news weakens the solidarity of strikers. Both news and comment exert a mild corrective power over abuses of the injunction power, inequitable court decisions, and infringements of civil liberties. Newspapers apparently exert only a very mild influence on wage standards, working conditions, and unemployment, but have in some cases facilitated the enactment of protective legislation.

EDUCATIONAL CAREER

A.B., Eureka College, 1926

A.M., University of Illinois, 1928

Assistant in Journalism, University of Illinois, 1927-1930

UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

AUBREY DILLER

FOR THE

Degree of Doctor of Philosophy

Monday, May 26, 1930, 9 a. m.
Room 108 Lincoln Hall

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF

Committee in Charge:

- Professor William A. Oldfather, Chairman
- Professor Herbert J. Barton
- Professor Matthew T. McClure
- Professor Glenn R. Morrow
- Professor Ben E. Perry
- Professor Joseph W. Swain

OUTLINE OF STUDIES

Major Subject: Classics (Greek)
First Minor Subject: Latin
Second Minor Subject: Ancient Oriental History

Thesis: STUDIES OF RACE MIXTURE AMONG THE GREEKS BEFORE ALEXANDER

SUMMARY

Classical antiquity is a keystone in the racial interpretation of history. It is often assumed that the Greek nation in a racial sense was a distinct and potential factor in the course of civilization. The present dissertation attempts to examine the evidence for this assumption with a view to elucidating or qualifying it. An introductory chapter examines the ideas of the Greeks about matters of race in general and in reference to themselves and their neighbors in particular. A second chapter describes the formation of the Greek people in prehistoric times. A third gives a collection of the instances of intermarriage between Greeks and barbarians as a basis of further study of race mixture in historical times.

EDUCATIONAL CAREER

A.B., University of Nebraska, 1925

A.M., University of Nebraska, 1927

Assistant in Latin, University of Illinois, 1927-1929

Fellow in Latin, University of Illinois, 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

GEORGE LEWIS EDGETT

FOR THE

Degree of Doctor of Philosophy

Thursday, June 5, 1930, 4 p. m.
Room 254, Mathematics Building

THE LIBRARY
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UNIVERSITY OF ILLINOIS

Committee in Charge:

Professor Arthur R. Crathorne, Chairman
Professor Robert H. Baker
Professor Robert D. Carmichael
Professor Harry Levy
Professor George A. Miller

OUTLINE OF STUDIES

Major Subject: Mathematics
First Minor Subject: Analysis
Second Minor Subject: Astronomy

Thesis: FREQUENCY DISTRIBUTIONS WITH GIVEN STATISTICS WHICH ARE NOT ALL MOMENTS

SUMMARY

A frequency curve has many well-known statistics. Some of these may be expressed in terms of moments and some may not. In fitting analytic curves to observed distributions usually a curve is found for which the moments of the observed data are the same as the moments of the analytic curve. In this paper analytic curves are found having statistics in common with the observed data which are not all moments or statistics reducible to moments.

Three different methods of finding such analytic curves are considered. First, by means of a differential equation; second, by means of a transformation of the normal curve of error; and, third, by means of a converging series. By the first method five analytic curves were found having given statistics in common with the raw data; by the second method four analytic curves were found; by the third method two analytic curves were found. The statistics used were some combination of the mean, standard deviation, mode, median, first quartile and third quartile.

EDUCATIONAL CAREER

B.A., Mount Allison University, 1923

M.A., Mount Allison University, 1926

Instructor in Mathematics, Mount Royal College, 1923-1925

Assistant in Mathematics, University of Illinois, 1925-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

RUTH HUMPHREY ELLIS

FOR THE

Degree of Doctor of Philosophy

Tuesday, May 20, 1930, 2 p. m.
Room 456 Chemistry Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF

Committee in Charge:

- Professor William C. Rose, Chairman
- Professor Reynold C. Fuson
- Professor Carl S. Marvel
- Professor Fred W. Tanner
- Doctor Vincent du Vigneaud

OUTLINE OF STUDIES

Major Subject: Chemistry (Physiological)
First Minor Subject: Organic Chemistry
Second Minor Subject: Bacteriology

Thesis: THE NUTRITIVE PROPERTIES OF GELATIN WITH PARTICULAR REFERENCE TO ITS TYROSINE CONTENT

SUMMARY

I.

1. With the protein at a 20% level, both 15% and 10% of gliadin have been found capable of supplementing gelatin to give fair growth.

2. A gelatin diet supplemented with 5% of gliadin is inadequate for growth, due in part to insufficient tryptophane. The addition of the latter makes the ration equal in value to one containing 10% of gliadin.

3. The addition of tyrosine to a diet containing 35% of gelatin, 0.4% of cystine, and 0.25% of tryptophane does not improve the rate of growth.

4. Animals fed, for a preliminary period, casein plus gelatin are better able to utilize the latter as a source of nitrogen than are animals transferred directly from casein to gelatin.

5. Either 800 mg. of yeast or 550 mg. of alcohol extracted casein supplement gelatin diets to give distinctly better growth. This is due partly to the increased intake of vitamin, and partly to the protein of good quality.

6. There is no evidence that methionine improves the quality of the gelatin diets.

II.

1. Gelatin is incapable of supplementing an amino acid mixture sufficiently to permit growth. Gliadin exerts a very slight supplementary action, while casein manifests a marked effect.

2. Extraction of hydrolyzed casein with butyl alcohol results in concentration of the active material. These fractions are more than twice as potent as casein.

EDUCATIONAL CAREER

B.A., Wellesley College, 1924

A.M., University of Illinois, 1928

Assistant in Chemistry, University of Illinois, 1926-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

JAMES PUTNAM GEORGE

FOR THE

Degree of Doctor of Philosophy

Monday, May 26, 1930, 3 p. m.
Room 212 Commerce Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

- Professor Nathan A. Weston, Chairman
- Professor William L. Burlison
- Professor Harold C. M. Case
- Professor Frederic E. Lee
- Professor Laurence J. Norton
- Professor Charles L. Stewart

OUTLINE OF STUDIES

Major Subject: Economics

First Minor Subject: Farm Organization and Management

Second Minor Subject: Agronomy

Thesis: AN ECONOMIC INQUIRY INTO THE CHARACTERISTICS AND USE OF LAND FOR PASTURE WITH SPECIAL REFERENCE TO ILLINOIS

SUMMARY

1. The topography of more than half of the land in permanent pasture on Illinois farms would permit of cultivation. There is within the state an undetermined amount of crop land which ought to be in permanent pasture. It is desirable to ascertain the underlying motives on the part of farmers in the utilization of their farm lands in pasture and other uses. Results of this investigation bring to light pertinent information relating to this problem.

2. The apportionment of pasture land among each of its several kinds was studied by farming type areas. The proportion of farm land pastured varied in different farming type areas from 37 to nearly 82 percent. The arithmetic mean for all the farms was about 60 percent. This included regular pasture and crop land, such as hayfields, fields of small grain, and corn fields, which was pastured after harvest.

3. The replacement method was applied in the evaluation of economic returns from the use of land as pasture. During the grazing season most of the roughages and a portion of the concentrates in the ration of dairy cows are replaced by sustenance derived from pastures. The replacement method considers the contribution made by pasture as equal to the difference between the net energy required by the cows for body maintenance and milk production, and the net energy supplied by feed other than pasturage. The differential contribution may be properly inputed to pasture. So computed, pasture contributions apparently are available on comparatively cheaper terms than other feed in the region studied.

EDUCATIONAL CAREER

B.S., Iowa State College, 1918
M.S., Cornell University, 1925

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

HORACE BEAVEN GILLESPIE

FOR THE

Degree of Doctor of Philosophy

Thursday, May 22, 1930, 2 p. m.
Room 176 Chemistry Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

- Professor Carl S. Marvel, Chairman
- Professor George L. Clark
- Professor Reynold C. Fuson
- Professor William C. Rose
- Professor Fred W. Tanner

OUTLINE OF STUDIES

Major Subject: Chemistry (Organic)
First Minor Subject: Physiological Chemistry
Second Minor Subject: Bacteriology

Thesis: THE STUDY OF HEXA-SUBSTITUTED ETHANES

SUMMARY

1. A satisfactory method has been found for synthesizing sym.-di-tert.-butyl-tetra-tert.-butylethynylethane.

2. The hydrocarbon is cleaved by liquid sodium-potassium alloy but not by 40 per cent sodium amalgam.

3. Sym.-dicyclohexyl-tetra-tert.-butylethynylethane has also been prepared. This compound is not cleaved by liquid sodium-potassium alloy and is therefore more stable than sym.-di-tert.-butyl-tetra-tert.-butylethynylethane.

4. No satisfactory general method has been found for synthesizing hexa-n-alkylethanes.

EDUCATIONAL CAREER

A.B., Lawrence College, 1925

M.S., University of Illinois, 1926

Fellow in Chemistry, Northwestern University, 1926-1927

Fellow in Chemistry, University of Illinois, 1928-1929, 1929-1930

PUBLICATIONS

With C. S. Marvel
Identification of Amines III Benzylsulphonamides.
J. Am. Chem. Soc., *48*, 2943, (1926)

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

ORVILLE EUGENE GOEHLER

FOR THE

Degree of Doctor of Philosophy

Monday, August 4, 1930, 9:30 a. m.
Room 161 Chemistry Building

THE LIBRARY OF THE
SEP [illegible]0 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

Professor G. Frederick Smith, Chairman
Professor George L. Clark
Professor B. Smith Hopkins
Professor Carl S. Marvel
Professor Elmer H. Williams

OUTLINE OF STUDIES

Major Subject: Chemistry (Analytical)
First Minor Subject: Organic Chemistry
Second Minor Subject: Physics

Thesis: THE PREPARATION AND PHYSICAL CONSTANTS OF PERCHLORIC ACID AND SOME OF ITS ALKALINE EARTH SALTS

Summary

1. A highly efficient "cold target" type of still-head has been developed after the investigation of a series of still-heads for the vacuum distillation of concentrated perchloric acid.

Sulfuric acid contamination (less than 5%) of perchloric acid is decreased a thousand fold for each vacuum distillation of concentrated perchloric acid.

Phosphoric acid contamination (less than 5%) is completely removed in one vacuum distillation from concentrated perchloric acid.

2. The dissociation of concentrated perchloric acid during vacuum distillation over a range of 8–18 mm. has been investigated.

A new method for the preparation of anhydrous perchloric acid has been developed.

An explanation of the phenomenon of superheating of perchloric acid has been given.

3. Absolute density and refractive index determinations of perchloric acid have been correlated with the percentage composition of acid samples prepared over a distillation range of 0.1–7.0 mm. The variation in the composition of the products thus prepared was found to be 0.30 per cent (1–7 mm.).

The freezing-point of the dihydrate of perchloric acid was investigated, and the phenomenon found has been explained on the basis that an oxonium structure exists for all the hydrates of perchloric acid.

4. Oxonium perchlorate was found to be a definite single compound with a melting-point of 49.91° C.

Pure oxonium perchlorate was used as a reference point for the determination of the exact composition of concentrated perchloric acid by physical rather than chemical means.

The absolute density of the dihydrate of perchloric acid (73.603%) was found to be 1.71287 d_4^{25} and the refractive index at 25°C. was found to be 1.42052.

EDUCATIONAL CAREER

B.S., Washington University, 1926

Assistant in Chemistry, University of Illinois, 1927-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

GEORGE ADAMS GRAHAM

FOR THE

Degree of Doctor of Philosophy

Monday, May 26, 1930, 9:30 a. m.
Room 424A Library Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

- Professor John A. Fairlie, Chairman
- Professor Clarence A. Berdahl
- Professor James W. Garner
- Professor Merlin H. Hunter
- Professor John M. Mathews

OUTLINE OF STUDIES

Major Subject: Political Science
Minor Subject: Economics

Thesis: SPECIAL ASSESSMENTS IN DETROIT

Summary

Special assessments for the opening, widening, and paving of streets in Detroit are made by the Common Council with the assistance of administrative officers, chiefly the Board of Assessors and the Condemnation Commission. The Charter of the City of Detroit prescribes a uniform method for making assessments for street paving. For street opening and widening it orders assessments to be made according to special benefit, and thus leaves the manner of assessment to the discretion of the Council and administrative officers.

There are three acts in making every assessment, (1) making the assessment district, (2) determining the distribution of special benefit, and (3) dividing the cost of the improvement between the district and the city. Although there have been many inconsistencies in performing these acts during the last fifteen years, certain general practices have developed which seem to be based upon principles underlying special benefit. In making assessment districts, authorities tend to act upon the principles that the area of special benefit is the area in which special use will be made of the improvement, and that the area is limited by the influence of competing streets. In determining distribution of special benefit, authorities tend to act upon the principles that special benefit varies inversely with distance from an improvement, that business sites receive more benefit than residence sites, and that certain parcels adjacent to the improved section receive peculiarly great benefit. In dividing costs, authorities frequently assign the city larger shares in proportion to the general importance of the improvement in the street plan of the city.

An assessment district is usually divided into zones along the district and into intervals across the district. Assessments per unit foot of land are diminished in both directions, along the district and across the district, with distance from the improvement.

Data for the study have been drawn largely from the records of the City of Detroit. More than thirty typical assessments are described in detail; attention is called to inconsistent and questionable practices. Among the changes suggested are (1) standardization of practice in making similar assessments and the preparation of a manual of directions or rules, (2) a program of systematic investigation by public authorities in the problems of special benefit, and (3) recording a brief explanation of the essential features of each special assessment.

EDUCATIONAL CAREER

A.B., Monmouth College, 1926

A.M., University of Illinois, 1927

Scholar in Political Science, University of Illinois, 1926-1927

Fellow in Political Science, University of Illinois, 1928-1929

Assistant in Political Science, University of Illinois, 1929-1930

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1930

UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

CARL GREEN

FOR THE

Degree of Doctor of Philosophy

Friday, May 23, 1930, 3:30 p. m.
Room 424A Library Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

Professor John A. Fairlie, Chairman
Professor Clarence A. Berdahl
Professor James W. Garner
Professor John M. Mathews
Professor Walter S. Monroe

OUTLINE OF STUDIES

Major Subject: Political Science
First Minor Subject: Education
Second Minor Subject: International Law

Thesis: SCHOOL LEGISLATION IN ILLINOIS

Summary

The first free school law in Illinois was enacted in 1825 under the administration of Governor Coles. But two years later the law was amended so that no person could be taxed for the support of schools without his written consent; and so that voters of a district might choose to raise only a part of the sum required to support their school by taxation. This latter provision remained a part of the school law, in some form, until 1855.

Prior to 1855, the Secretary of State was head of the school system *ex officio*; but since that time, the head (Superintendent of Public Instruction) of the system has been a separately elected official. No qualifications are necessary for holding the office, other than those imposed on state officials generally.

Money for meeting the expenses of the school system is raised largely by direct taxation in each local district; supplemented however, in common school districts by a state distributive fund. The first distribution of this fund—made in 1836—amounted to $9,601. By 1870, it had reached $885,120; and the sum of ten million dollars has been appropriated for 1930. In 1870, local districts received from taxes, distributive fund, and issuance of bonds, a total of $7,045,897. By 1928, this amount had increased to $196,097,504.

Provision for free schools was entirely statutory until the adoption of the present constitution in 1870. That instrument imposes an obligation on the General Assembly to "provide a thorough and efficient system of free schools, whereby all children of this state may receive a good common school education."

High schools, however, exist in Illinois by virtue of court interpretation. This had its inception in the case of *Richards* v. *Raymond*, 92 Ill. 612 (1879) where the Supreme Court of the state held that the term "common school" in the constitution should be construed to include high schools, although the convention which framed the constitution, thought it was explicitly excluding high schools from the category of free schools.

Five different methods have been provided by law under which high school districts may be organized. In addition, two high school acts have been declared unconstitutional by the Supreme Court. However, the General Assembly has validated practically all organizations effected under those void acts.

EDUCATIONAL CAREER

B.E., Eastern Illinois State Teachers College, 1924
A.M., University of Illinois, 1925

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

ESTHER MERYL GRIFFITH

FOR THE

Degree of Doctor of Philosophy

Thursday, May 29, 1930, 2 p. m.
Room 176 Chemistry Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

- Professor Carl S. Marvel, Chairman
- Doctor Ludwig F. Audrieth
- Professor Ralph L. Shriner
- Doctor Leonard L. Steimley
- Professor Leonard F. Yntema

OUTLINE OF STUDIES

Major Subject: Chemistry (Organic)
First Minor Subject: Inorganic Chemistry
Second Minor Subject: Mathematics

Thesis: PART I. A STUDY OF HEXAPHENYLETHINYLETHANE

PART II. THE STRUCTURE OF THE ADDITION COMPOUNDS OF MERCURIC SALTS AND OLEFINES

SUMMARY

PART I. A STUDY OF HEXAPHENYLETHINYLETHANE

1. Triphenylethinyl carbinol has been prepared by a new procedure.

2. Triphenylethinylchloromethane could not be prepared by the action of phosphorus trichloride, thionyl chloride or acetyl chloride on the carbinol, but triphenylethinylbromomethane has been prepared by the action of acetyl bromide and forty percent aqueous hydrobromic acid on the carbinol.

3. Silver reacted with triphenylethinylbromomethane to give a product which was apparently triphenylethinylmethyl peroxide.

4. An acid has been prepared from the action of carbon dioxide on the metal alkyl obtained from the action of sodium-potassium alloy on triphenylethinylbromomethane, but it proved too unstable to analyze.

5. The results obtained indicated that triphenylethinylmethyl is capable of existence as a free radical.

PART II. THE STRUCTURE OF THE ADDITION COMPOUNDS OF MERCURIC SALTS AND OLEFINES

1. Cinnamoyl chloride has been prepared in good yields by the action of thionyl chloride on cinnamic acid.

2. The 1–menthylamide of cinnamic acid has been prepared from the reaction of 1–menthylamine and cinnamoyl chloride.

3. Mercuric acetate has been added to the 1–menthylamide of cinnamic acid in methyl alcohol solution. The addition compound is not very stable. Definite isomers could not be obtained by the fractional crystallization of the addition product.

4. The d– and 1–octanol–2 esters of cinnamic acid have been prepared, and mercuric acetate added to them in methyl alcohol solution. The addition products are liquids at room temperature.

5. d–Bornyl cinnamate has been prepared by the reaction of d–borneol and cinnamoyl chloride.

6. Mercuric acetate has been added to d–bornyl cinnamate in methyl alcohol solution. The addition product could not be separated into isomers by fractional crystallization. However, when the acetoxymercuri compound was converted into the bromo-mercuri compound and the product fractionally crystallized, two optically active isomers were obtained.

7. The isolation of two optically active isomers from the addition product is further evidence that the compound is a true addition compound rather than a molecular addition compound.

EDUCATIONAL CAREER

A.B., University of Missouri, 1920

A.M., University of Missouri, 1923

Assistant in Chemistry, University of Illinois, 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

ALBERT NELSON GUTHRIE

FOR THE

Degree of Doctor of Philosophy

Tuesday, May 27, 1930, 4 p. m.
Room 203 Physics Laboratory

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

- Professor Elmer H. Williams, Chairman
- Professor Robert D. Carmichael
- Professor Charles T. Knipp
- Professor Jakob Kunz
- Professor Francis W. Loomis
- Professor Floyd R. Watson

OUTLINE OF STUDIES

Major Subject: Physics
First Minor Subject: Mathematics
Second Minor Subject: Theoretical Physics

Thesis: MAGNETIC PROPERTIES OF THE PALLADIUM METALS AND SOME OF THEIR COMPOUNDS

SUMMARY

Magnetic susceptibility measurements have been made on samples of the metals ruthenium, rhodium, and palladium and the compounds $RuCl_3$, RuO_2, $RhCl_3$, and Rh_2O_3 by means of an improved Curie balance.

The law of variation of the susceptibility with temperature has been determined in order to determine the elementary magnetic moments by the Weiss Law. It is found that the susceptibilities of palladium and $RuCl_3$ follow a Weiss Law. The susceptibilities of the other metals and compounds either increase or do not change with increasing temperature.

The law for palladium is not the same over the whole temperature range. From 25° C. to 200° C. the elementary magnetic moment is 7.2 Weiss magnetons. From 200° C. to 450° C. the number is eight within the limits of error.

The law of variation of susceptibility with temperature for $RuCl_3$ leads to an elementary magnetic moment of 9.85 Weiss magnetons. The spectroscopic method of Hund predicts a value of 29.45 Weiss magnetons.

EDUCATIONAL CAREER

B.S., University of Arizona, 1926

M.S., University of Illinois, 1928

Assistant in Physics, University of Illinois, 1926-1929

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

ROY HANSEN

FOR THE

Degree of Doctor of Philosophy

Monday, May 12, 1930, 9 a. m.
Room 366, Chemistry Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

Professor Fred W. Tanner, Chairman
Professor William L. Burlison
Professor Ernest E. DeTurk
Professor Charles F. Hottes
Professor William C. Rose

OUTLINE OF STUDIES

Major Subject: Bacteriology
First Minor Subject: Agronomy
Second Minor Subject: Physiological Chemistry

Thesis: THE NODULE BACTERIA OF THE LEGUMINOSAE WITH SPECIAL REFERENCE TO THE MECHANISM OF INOCULATION

SUMMARY

A correlation has been shown to exist between the seed protein complexes of legumes as determined by the precipitin test and cross-inoculation of the nodule bacteria which infect their roots. Similarly, a correlation between the protein complexes of the bacteria as determined by the agglutination reaction and cross-inoculation of these bacteria has been claimed. Three unusual plant inoculation crosses, the non-reciprocal lima bean bacteria on navy bean roots, and dalea bacteria on navy bean roots, and the reciprocal cowpea-soybean cross were examined by serological and plant inoculation methods. It was found that all three are exceptions to the above-mentioned correlations, and these exceptions stand in the way of an explanation of the mechanism of inoculation based on protein compatibilities.

EDUCATIONAL CAREER

B.S., University of Illinois, 1914

M.S., University of Illinois, 1918

Assistant in Nitrogen-Fixation Research, University of Illinois, 1914-1916

Assistant, then Associate, Division of Soil Biology, Department of Agronomy, University of Illinois, 1917-1920 (except for service in World War)

Professor of Soils, University of Saskatchewan, Canada, 1920-1924

PUBLICATIONS

Burrill, T. J. and ————. Is symbiosis possible between legume bacteria and non-legume plants? Ill. Agr. Exp. Sta. Bul., **202**, (1917), 115-181.

————. Note on the flagellation of the nodule organisms of the *Leguminosae.* Sci., N. S., **50**, (1919), 568-569.

Whiting, A. L. and ————. Cross-inoculation studies with the nodule bacteria of lima beans, navy beans, cowpeas and others of the cowpea group. Soil Sci., **10**, (1920), 291-300.

Löhnis, F. and ————. Nodule bacteria of leguminous plants. Jour. Agr. Res., **20**, (1921), 543-555.

————. Symbiotic nitrogen-fixation by leguminous plants, with special reference to the bacteria concerned. Proc. West. Canad. Soc. Agron., **1**, (1920), 105-116.

————. Symbiotic nitrogen-fixation by leguminous plants, with special reference to the bacteria concerned. Sci. Agr., **1**, (1921), 59-62.

————. Inoculation for legumes. Univ. Sask. Agr. Ext. Bul., **1**, (1921), 1-4.

————, Joel, A. H., and Wilson, A. M. Soil Survey of Baildon Municipality No. 131, Hillsborough Municipality No. 132, Moose Jaw Municipality No. 161, and Caron Municipality No. 162. Univ. Sask. Soil Survey Rpt., **1**, (1923), 1-47.

————, Joel, A. H., and Wilson, A. M. Soil Survey of Swift Current Municipality No. 137, etc. Univ. Sask. Soil Survey Rpt., **2**, (1923), 1-57.

————, Joel, A. H., and Wilson, A. M. Soil Survey of Local Improvement Districts Nos. 21, 22 and 52, etc. Univ. Sask. Soil Survey Rpt., **3**, (1925), 1-46.

————, Joel, A. H., and Wilson, A. M. Soil Survey of Weyburn Municipality No. 67, etc. Univ. Sask. Soil Survey Rpt., **4**, (1926), 1-55.

Joel, A. H., ————, and Wilson, A. M. Soil Survey of the Rosetown Area, etc. Univ. Sask. Soil Survey Rpt., **6**, (1927), 1-52.

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

HAN TAO WU

FOR THE

Degree of Doctor of Philosophy

Wednesday, May 28, 1930, 2 p. m.
Room 424A Library Building

THE LIBRARY OF THE
MAY 24 1930

COMMITTEE IN CHARGE:

- PROFESSOR JAMES W. GARNER, Chairman
- PROFESSOR CLARENCE A. BERDAHL
- PROFESSOR JOHN A. FAIRLIE
- PROFESSOR ALBERT H. LYBYER
- PROFESSOR JOHN M. MATHEWS
- PROFESSOR JOSEPH W. SWAIN

OUTLINE OF STUDIES

Major Subject: Political Science
First Minor Subject: International Law
Second Minor Subject: European History

Thesis: RESPONSIBILITY OF STATES FOR INJURIES SUSTAINED BY ALIENS ON ACCOUNT OF ACTS OF INSURGENTS

Summary

The problem of the responsibility of states for injuries suffered by aliens through acts of insurgents is in its nature (1) international rather than municipal and (2) legal rather than moral. In view of the precedents and practice of modern states, the state whose government is established by successful insurgents and has been recognized as such is responsible under international law for injuries caused to aliens by acts of such insurgents done at any time after the inception of the revolution. On the other hand, in the event of an unsuccessful revolution, a state is not, as a general rule, responsible under international law for acts of its insurgent subjects by which aliens are injured when the revolution has passed beyond the control of the titular government and when, in fact, a condition of *force majeure* has come into existence. Even when the insurgents are not beyond the control of the legitimate authorities, the state should not be held directly or originally responsible for injuries sustained by aliens in consequence of the acts of such insurgents, unless it has failed to exercise due diligence to prevent the injury or to bring the guilty parties to justice and local remedies have been exhausted without adequate redress for such failure. Of course, the state must assume the responsibility for the injurious acts of insurgents towards aliens if there is proven fault or complicity on its part. It is further true that a state is relieved of responsibility when an injury to an alien results from acts of the unsuccessful insurgents committed after their recognition as belligerents either by itself or by the state of which the alien is a national. In practice, however, an exception to the general doctrine of irresponsibility for acts of unsuccessful insurgents exists where responsibility has been admitted under treaty stipulations or by other express agreements. Moreover, no matter whether recognition of different degrees is accorded to the insurgents or not, or regardless of an unsuccessful revolution, all normal or governmental acts of the insurgent *de facto* government accomplished in an ordinarily lawful manner, that is, such acts as are necessary to peace and good order among inhabitants, foreign or native, in the insurgent community or done for the public benefit thereof, which would be valid if emanating from a lawful government and which are not contrary to the established rules of international law, are, in general, treated as valid and binding. Again, any injuries received by aliens from the acts of insurgents when they are engaged, without violation of the laws of war, in the military operations against the legitimate government do not involve the responsibility of the state of which such insurgents are subjects. There is no doubt as to the irresponsibility of a state for injuries done to aliens by its insurgent subjects when such injuries grow out of the aliens' own fault or neglect or are due to their breach of municipal laws or international law. Finally, all claims with respect to injuries caused by acts of insurgents are pecuniary and legal in their nature; and, therefore, a dispute between two states over such claims, if not settled by the ordinary methods of diplomacy, should be submitted to a legal, that is, judicial, method of settlement, especially, to decision by international arbitration.

EDUCATIONAL CAREER

M.L. (LL.B., in U.S.A.), Tokyo Imperial University, Japan, 1924

Graduate Student, Universities of Chicago and Kansas, 1925-1926, and University of Illinois, 1926-1930.

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

FRANCES HARSHBARGER

FOR THE

Degree of Doctor of Philosophy

Tuesday, May 20, 1930, 4 p.m.
Room 254 Mathematics Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILL

Committee in Charge:

- Professor Arthur B. Coble, Chairman
- Professor Robert D. Carmichael
- Professor Charles T. Knipp
- Professor Harry Levy
- Professor George A. Miller

OUTLINE OF STUDIES

Major Subject: Mathematics
First Minor Subject: Analysis
Second Minor Subject: Physics

Thesis: THE GEOMETRIC CONFIGURATION DEFINED BY A SPECIAL ALGEBRAIC RELATION OF GENUS FOUR

SUMMARY

In this thesis the geometric configuration defined by the (3, 3) form, $F = t_1{}^3\tau_1{}^2\tau_2 + t_1{}^2t_2\,\tau_2{}^3 + t_1\,t_2{}^2\tau_1{}^3 - t_2{}^3\tau_1\,\tau_2{}^2$ is studied. The quadrics on the elliptic quintic curve in a space of four dimensions are expressed in terms of the form F. The two space cubic curves defined by $F = 0$ are obtained and the collineation group which leaves them unaltered is determined. The planar rational icosahedral sextic is obtained by means of the involution cut out on one space cubic curve by the ∞^2 quadrics on the other. The configuration of nodes of the sextic is studied. The cubic envelopes perspective to the rational sextic are obtained. The locus of cusps of the cubic envelopes is the sextic of genus four invariant under the icosahedral group. The quartic surfaces, the Cayley symmetroid and the Jacobian, and the Stahl quadric are determined. The nodes of the symmetroid which are in one-to-one correspondence with the nodes of the planar rational sextic also form a special configuration. The two rational space sextic curves, which are related to the symmetroid, and the cubic surface on which the sextics lie are obtained. The six four-fold secants of the two sextic curves determine a double six on the cubic surface.

EDUCATIONAL CAREER

A.B., Grinnell College, 1923

A.M., West Virginia University, 1925

Assistant in Mathematics, University of Illinois, 1927-1929

Fellow in Mathematics, University of Illinois, 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

WINFRED AUDIF HARBISON

FOR THE

Degree of Doctor of Philosophy

Saturday, May 24, 1930, 10 a. m.
Room 424A Library Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY

Committee in Charge:

- Professor Theodore C. Pease, Chairman
- Professor John A. Fairlie
- Professor Albert H. Lybyer
- Professor John M. Mathews
- Professor William S. Robertson

OUTLINE OF STUDIES

Major Subject: History

First Minor Subject: American History

Second Minor Subject: Political Science

Thesis: THE OPPOSITION TO PRESIDENT LINCOLN WITHIN THE REPUBLICAN PARTY

SUMMARY

President Lincoln encountered opposition from his party followers from the very outset of his Administration. His cautious policy toward the rebellion soon aroused the dissatisfaction of zealous and impatient Republicans. The military failure which attended the Union armies with almost disastrous persistency during the first two years of the war was largely attributed by many ardent Republicans, both in and out of Congress, to a lack of earnestness and competency on the part of the President and his subordinates. Consequently there arose during 1862 a widespread demand for a more vigorous prosecution of the war. The more radical elements of the party also opposed his conservative policy toward slavery with increasing numbers and intensity until he issued his preliminary emancipation proclamation in September, 1862. All this discontent received definite measurement by the anti-Administration vote in the fall elections and by the expressed want of confidence of the Republican Senators in the President and his Cabinet.

During 1863 the opposition lost much of its former vigor and comprehensiveness. By the beginning of 1864, however, it was reconcentrating in an effort to prevent Lincoln's renomination. Although this movement had the active or passive support of many of the most influential Republican leaders, it met a decisive failure because the rank and file of the party stood by the President. When, during July and August, military failure again aroused discontent with his conduct of the war, his Republican opponents attempted to displace him by another candidate, but without success. After his triumphant reelection his opponents, in decreasing numbers, took their stand against his reconstruction policy, a position which they held to the end.

EDUCATIONAL CAREER

A.B., Wabash College, 1924

A.M., University of Illinois, 1926

Assistant in Classics, University of Illinois, 1925-1926

Assistant in History, University of Illinois, 1927-1929

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

LLOYD ALVIN HELMS

FOR THE

Degree of Doctor of Philosophy

Wednesday, November 26, 1930, 9 a. m.
Room 209, Commerce Building

THE LIBRARY OF THE
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UNIVERSITY OF ILLINOIS.

Committee in Charge:

- Professor Nathan A. Weston, Chairman
- Professor Edward Berman
- Professor James W. Garner
- Professor Horace M. Gray
- Professor Merlin H. Hunter
- Professor Frederic E. Lee
- Professor Ivan Wright

OUTLINE OF STUDIES

Major Subject: Economics
First Minor Subject: Public Utilities
Second Minor Subject: Political Science

Thesis: THE CONTRIBUTIONS OF LORD OVERSTONE TO THE THEORY OF CURRENCY AND BANKING

Summary

Overstone conceived that the Bank reserve consisted of Bank notes held in reserve back of demand liabilities, other than notes, whereas the usual conception was that the reserve consisted of precious metal held back of all liabilities.

Circulation consisted of coin and notes held by the banking department and by the rest of the public.

Monopoly of issuing would permit proper regulation of the circulation which could not be obtained under unlimited competition.

Depreciation of money existed relatively to other countries. The Act of 1819 provided for the convertibility of the note but did not provide for its ample and specific security. The principle that paper money should vary in amount as bullion varied was the proper principle to follow in regulating the circulation.

Overstone originated the idea of the separation of the departments as the practical means of securing the convertibility of the note and its regulation according to the principle of metallic variation.

The power of note issue should not be used to support credit. The importance of an elastic currency was not seen, but the adoption of Overstone's principles greatly stimulated the development of deposits.

A practical point of view was taken of the quantity theory of money. There tended to be an inverse variation between the quantity of money and its value, and a direct variation between the quantity of money and price. Other factors had to be considered in an actual price change; the quantity of money was a minor cause of price change.

EDUCATIONAL CAREER

Rector Scholar, DePauw University, 1920-1922, 1923-1925

A.B., DePauw University, 1925

A.M., University of Illinois, 1926

Scholar in the Economics of Public Utilities, University of Illinois, 1925-1926

Fellow in the Economics of Public Utilities, University of Illinois, 1926-1927

Assistant in Economics, University of Illinois, 1927-1930

Head of Department of Business Administration, Geneva College, 1930-

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

EARL WILTON HENDERSON

FOR THE

Degree of Doctor of Philosophy

Monday, May 26, 1930, 8 a.m.
Room 331 New Agriculture

THE LIBRARY OF THE
MAY 24 1930
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Committee in Charge:

Professor Leslie E. Card, Chairman
Professor Harold H. Mitchell
Professor Henry P. Rusk
Professor Waldo Shumway
Professor Clyde M. Woodworth
Professor Charles Zeleny

OUTLINE OF STUDIES

Major Subject: Animal Husbandry (Poultry)
First Minor Subject: Animal Breeding
Second Minor Subject: Embryology

Thesis: THE INFLUENCE OF TEMPERATURE AND BREEDING UPON THE RATE OF GROWTH OF CHICK EMBRYOS

SUMMARY

A review of studies of a variety of influences upon the development of the chick embryo reveals the fact that a vast amount of research is needed before specific optimum conditions can be established.

In this investigation a study of temperature influences indicates that the chick embryo in its early stages responds in a manner similar to cold blooded animals. Toward the close of the incubation period, or about the sixteenth day, the embryo appears to develop a degree of ability to control its own temperature within limits. The lethal temperature limits for development to approximately the 96 hour stage appear to be slightly beyond 108° F. and 94° F. The limits for development to the normal sixteen day stage appear to be 107° and 95° F. Temperature coefficients were calculated at several stages.

In order to determine the influence of breeding upon the embryonic development, embryos from two breeds which differ markedly in mature weight were incubated at a temperature of 101.8° F. Results indicate that there is little significant difference in the growth of embryos from Single Comb White Leghorns, Dark Cornish or reciprocal cross matings of the two breeds.

These conclusions are based on the growth of the embryo as measured by average daily wet and dry weights, and nitrogen content, from the fourth to the twentieth days of incubation.

EDUCATIONAL CAREER

B.S. in Agr., University of Missouri, 1921

A.M., University of Missouri, 1924

Instructor in Poultry Husbandry, University of Missouri, 1921

Assistant Professor in Poultry Husbandry, University of Missouri, 1922

Professor of Poultry Husbandry, Iowa State College, 1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION
OF
HENRY GEORGE HENDRICKS
FOR THE
Degree of Doctor of Philosophy

Saturday, May 24, 1930, 9 a. m.
Room 212 Commerce Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

Professor Merlin H. Hunter, Chairman
Professor Frederick C. Dietz
Professor Maurice H. Robinson
Professor Nathan A. Weston
Professor Ivan Wright

OUTLINE OF STUDIES

Major Subject: Economics
Minor Subject: English History

Thesis: THE FEDERAL DEBT, 1919-1929

SUMMARY

The participation of the United States in the World War increased its national debt by about twenty-five billion dollars, gross amount. The net amount was about one-half of that sum. Practically all the debt was floated in the domestic market and is still held at home. The ownership, however, seems to have become concentrated in fewer hands than it was originally.

Two factors complicated the problem of paying off the debt. Public expenditures had become greatly enlarged and the war revenue system was unsuited to peace times. Within three years of the end of the war the Government materially reduced expenditures. And in a succession of acts it adjusted the revenue system to the needs of peace conditions.

The Government paid off about one-third of the principal of the debt in the period from 1920 to 1929. It obtained the funds for the payments chiefly from the general fund balance, appropriations for the sinking fund, foreign payments, and the surplus. It had to refund the part of the maturing debt it had not the means to pay. The transactions in paying and refunding the debt were affected somewhat by money market conditions and also tended to disturb the market. But the nature of the market and the banking mechanism prevented serious disturbances. Falling prices tended to increase the burden of debt payment in the first part of the period. Increases in per capita income, however, partly offset that tendency. The behavior of these two factors seems to indicate that the Government should prolong the payment of the debt.

EDUCATIONAL CAREER

A.B., University of Texas, 1924

A.M., University of Texas, 1925

Tutor in English History, University of Texas, 1923-1925

Part-time Instructor in Economics, University of Texas, 1925-1926

Assistant in Economics, University of Illinois, 1926-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

ISTER MARY EVANGELA HENTHORNE, B.V.M.

FOR THE

Degree of Doctor of Philosophy

Tuesday, May 27, 1930, 9 a. m.
Room 424A Library Building

THE LIBRARY OF THE
MAY 24 1930

Committee in Charge:

- Professor Marcus L. Hansen, Chairman
- Professor Frederick C. Dietz
- Professor Laurence M. Larson
- Professor Thomas E. Oliver
- Professor Theodore C. Pease

OUTLINE OF STUDIES

Major Subject: History (American)
Minor Subject: French

Thesis: THE CAREER OF THE RIGHT REVEREND JOHN LANCASTER SPALDING, BISHOP OF PEORIA

SUMMARY

John Lancaster Spalding, Bishop of Peoria, Illinois, from 1877 to 1908, was thoroughly American, highly cultured, and enthusiastically devoted to the furthering of any work looking to the good of his church, his country, or his fellowman, but his activity was always that of the promoter, and the consequence is that, in general, when he is remembered at all it is only as the writer of a few books of essays which have been allowed to go out of print, and as the bishop of a comparatively unimportant diocese. It is said that he was a power in his day but that his influence died with him; only a few people remember that he was interested in western colonization and that he was a member of the Anthracite Strike Commission; while it is recognized that he was a scholar and a philosopher of education, few know that he was eminently practical in all his teaching or that he was in any way responsible for the success of the Catholic Educational Exhibit at the World's Columbian Exposition or for the establishment of the Catholic University of America; and finally, because he lectured and preached so constantly throughout the country, it has been inferred that he gave little attention to the administration of his diocese and preached but seldom to his own people.

The conclusions reached in this study of Bishop Spalding as churchman, sociologist, writer, educator, and prelate, are: (1) that he was the outstanding American Catholic churchman in the last quarter of the nineteenth century and that his influence still lives; (2) that but for him, in all probability, the Irish Catholic Colonization Association project of 1879 would have failed of realization; (3) that as a member of the Anthracite Strike Commission of 1902-3 he exerted a markedly helpful influence on the work of the Commission, particularly in the preparation of the report; (4) that few orators in America have brought to the rostrum and pulpit finer spiritual, mental, and physical equipment than he, or used their gifts so constantly or with more power, eloquence, and effectiveness; (5) that for sincerity, perfection of style, scholarliness, and correct and inspirational teaching his books merit an honored place in American literature; (6) that the success of the Catholic Educational Exhibit was due chiefly to his earnest, intelligent and constant promotion of the enterprise; (7) that he was the founder of the Catholic University of America; and (8) that his government of his diocese was singularly efficient.

EDUCATIONAL CAREER

A.B., Catholic University of America, Washington, D. C., 1916

Teacher for 19 years in the high schools of the Congregation of the Sisters of Charity of the Blessed Virgin Mary

A.M., University of Illinois, 1927

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

SAMUEL CHARLES KENDEIGH

FOR THE

Degree of Doctor of Philosophy

Friday, May 23, 1930, 10 a. m.
Room 108 Administration Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

Professor Victor E. Shelford, Chairman
Professor Leverett A. Adams
Professor William E. Burge
Professor Charles F. Hottes
Professor Henry B. Ward
Professor Charles Zeleny

OUTLINE OF STUDIES

Major Subject: Zoology (Ecology)
First Minor Subject: Plant Ecology
Second Minor Subject: Physiology

Thesis: THE ROLE OF TEMPERATURE AND OTHER ENVIRONMENTAL FACTORS IN THE LIFE OF BIRDS

SUMMARY

Climate is a factor of major importance in controlling the distribution, seasonal occurrence, and abundance of passerine birds in the biotic communities of eastern North America.

1. There are limits of physiological tolerance to high and low temperatures and other environmental factors.

2. Much of the behavior of birds is a response to the interaction of physiological potentialities and environmental conditions, and is adjusted to maintain the best possible relation between the two for the existence of the individual and for reproduction.

3. Merriam's temperature laws cannot be accepted as representing the controlling factors in animal and plant distribution.

4. Daily minimum temperatures are important in limiting northward distribution of birds, daily maximum temperatures are important in limiting southward distribution, decrease in relative humidity is important westward, while on the east of the breeding range (Acer-Fagus Association) and on the east and south of the wintering range (south Atlantic and Gulf states), physiographic features are limiting. Other climatic and environmental factors appear of lesser significance in controlling bird distribution.

5. The migration of birds is controlled and regulated through relation of environmental factors to physiological processes.

6. Regional and yearly abundance of birds is dependent upon climatic factors, such as temperature, and to a lesser extent on other environmental factors.

EDUCATIONAL CAREER

A.B., Oberlin College, 1926
A.M., Oberlin College, 1927
Fellowship in Zoology, 1928-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

GILBERT MACBETH

FOR THE

Degree of Doctor of Philosophy

Saturday, October 4, 1930, 9:30 a. m.
Room 108 Administration Building

THE LIBRARY OF THE
OCT 14 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

- Professor Walter J. Graham, Chairman
- Professor Edward C. Baldwin
- Professor Harry S. V. Jones
- Professor Thomas E. Oliver
- Professor Harry G. Paul

OUTLINE OF STUDIES

Major Subject: English
First Minor Subject: Philology
Second Minor Subject: French

Thesis: JOHN GIBSON LOCKHART: A CRITICAL STUDY

SUMMARY

John Gibson Lockhart (1794-1854) was a novelist, verse-writer, critic, and biographer. His creative writings are of more significance historically than intrinsically. His four novels reflect certain aspects of the fiction of Germany during the time and in the preceding half-century. His first novel, *Valerius,* the first English novel of any consequence with scenes laid in classical times, was probably suggested by similar German works. His later novels exhibit the same psychological interests as much of the German fiction, as well as that of William Godwin, and foreshadow the course that the English novel was to take during the nineteenth century. Lockhart's verse-translations of the early Spanish ballads demonstrate his fine æsthetic sensitiveness, best exemplified in his literary criticism. His literary judgments while a reviewer for *Blackwood's Magazine* (1817-1825) and while editor of the *Quarterly Review* (1825-1853) are ordinarily marked by acuteness and soundness of judgment, coupled with fine feeling for the best of contemporary literary production. His main fault is the occasional manifestation of a political or an ethical bias. Both his excellences and his defects as a critic are largely explained by his background, which is to a great extent German. The historical point of view which he shared with the critics of Germany enabled him in most instances to perform satisfactorily his function as reviewer in estimating for the public contemporary publications. A sometimes deleterious outgrowth of this point of view was an insistence upon national and ethical elements in literature which at times obscured his literary vision. As editor of the *Quarterly Review,* he exerted his influence in general in behalf of sound and fair critiques. His efforts as a writer for *Blackwood's Magazine,* in spreading the knowledge of German literature in England, notably contributed to the whole movement. His biographies of Burns and Scott, the culmination of an abiding interest in human nature which expressed itself also in his satirical and polemical writings in *Blackwood's Magazine* and elsewhere, best exhibit the balance and the penetration that appear in varying degrees in all of Lockhart's writings.

EDUCATIONAL CAREER

A.B., Miami University, 1925

A.M., University of Illinois, 1926

Scholar in English, University of Illinois, 1925-1926

Assistant in English, University of Illinois, 1926-1927

Fellow in English, University of Illinois, 1927-1928

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

VIVIAN KIRKPATRICK McLARTY

FOR THE

Degree of Doctor of Philosophy

Tuesday, May 27, 1930, 4 p. m.
Room 424A Library Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

- Professor Albert H. Lybyer, Chairman
- Professor John A. Fairlie
- Professor Laurence M. Larson
- Professor William S. Robertson
- Professor Joseph W. Swain

OUTLINE OF STUDIES

Major Subject: History (European)
First Minor Subject: Political Science
Second Minor Subject: History

Thesis: THE RELATION OF NAPOLEON III WITH ENGLAND

SUMMARY

Napoleon III, very much like his famous ancestor, usurped the sovereign power in France during the period 1848 to 1852. In order to strengthen his position in Europe and secure recognition for his dynasty, he sought the friendship of the Great Powers, and particularly of England, by whom he was rewarded in 1854 with a treaty of alliance. Prior to this England had treated him with cordiality, but from then on his chances for success were greatly increased.

England and France were associated together in various spheres during Napoleon's rule—in the Crimean War and in questions regarding China 1857 to 1858, Naples 1856 and later, Moldavia and Wallachia 1856 to 1858, Greece 1857 and again 1862 to 1863, Italy 1859, Syria 1860 to 1861, and Mexico in 1861 to 1862. Commercial affairs were arranged in a treaty of 1860 and despite several disagreeable occurrences such as Orsini's attempt on the Emperor's life and the numerous invasion panics in England, Napoleon continued to claim the English alliance.

From 1859 on, however, England began to suspect Napoleon's motives, and instead of helping him, often did just the opposite. She refused to incline to his views in the Polish troubles of 1863 and in the Schleswig-Holstein war of 1863 to 1864 and the Austro-Prussian war of 1866 they could come to no agreement. Finally in the Franco-Prussian war of 1870 which brought about Napoleon's downfall, England did little to prevent it but did offer him refuge when it was over.

The English alliance had been Napoleon's making, but due to differences in the temperament of the French and English and also due to his own shifting policies, it failed him, and he went down before the power of Germany, rising at the east.

EDUCATIONAL CAREER

A.B., University of Illinois, 1923

A.M., University of Illinois, 1924

Scholar in Political Science, University of Illinois, 1923-1924

Assistant in History, University of Illinois, 1926-1928

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

FRANK JAMES McCLURE

FOR THE

Degree of Doctor of Philosophy

Tuesday, April 8, 1930, 2 p. m.
Room 557, Old Agriculture

Committee in Charge:

Professor Harold H. Mitchell, Chairman
Professor William E. Burge
Professor William C. Rose
Professor Henry P. Rusk
Professor Fred W. Tanner

OUTLINE OF STUDIES

Major Subject: Animal Husbandry (Nutrition)
First Minor Subject: Bacteriology
Second Minor Subject: Physiological Chemistry

Thesis: THE EFFECT OF FLUORINE ON CALCIUM METABOLISM AND ITS BEARING ON THE VALUE OF PHOSPHORITE MINERALS IN ANIMAL NUTRITION

SUMMARY

Studies reported in the literature have shown that raw rock phosphate as a mineral supplement may exert harmful effects on animals when consumed in considerable amounts and have indicated that the fluorine content of the mineral may be responsible, since fluorides are toxic. The present study is an attempt to determine the effects of fluorine on the growth, the development of bones and teeth and the utilization of calcium of young rats, and on the calcium utilization of swine. The fluoride was fed at varying levels either as sodium fluoride, calcium fluoride, or rock phosphate.

Sodium fluoride at a concentration of .06 percent depressed the growth of rats entirely aside from its effect on food consumption, lowered the rate of calcium retention and modified the composition of the bones and the structure of the teeth. Some of these effects were brought about at concentrations of .03 percent. Insoluble calcium fluoride was appreciably less effective in these respects, except with reference to the modification of the teeth.

Swine also were found to be susceptible to the deleterious effects of fluorine, either as calcium fluoride or as rock phosphate. It is inadvisable to supply the major part of the calicum requirement of pigs (4 to 6 grams daily) or even one-half of this requirement, in the form of rock phosphate. One-third or less of the requirement may be so supplied for a few months at least, with no expectation of disastrous results. There is no implication, however, that even this limited use of rock phosphate is advisable.

EDUCATIONAL CAREER

B.S., Purdue University, 1919

M.S., Purdue University, 1924

Assistant in Animal Nutrition, University of Illinois, 1927-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

ALYCE EDYTHE MANGE

FOR THE

Degree of Doctor of Philosophy

Monday, May 26, 1930, 4 p. m.
Room 424A Library Building

THE LIBRARY
MAY 24 1930
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Committee in Charge:

- Professor Albert H. Lybyer, Chairman
- Professor John A. Fairlie
- Professor Laurence M. Larson
- Professor Theodore C. Pease
- Professor William S. Robertson
- Professor Joseph W. Swain

OUTLINE OF STUDIES

Major Subject: History
Minor Subject: Political Science

Thesis: THE PRINCIPAL PHASES OF THE NEAR EASTERN POLICY OF THE EMPEROR NAPOLEON III

SUMMARY

Some of the greatest historical movements of international significance had their setting in the region bordering on the Eastern Mediterranean, Aegean, and Black Seas, known as the Near East. In the middle of the nineteenth century, this region was identical with that major part of the Ottoman Empire which comprised the Balkan Peninsula, Asia Minor, Syria, and Egypt. For personal, domestic, and diplomatic motives, the Emperor Napoleon III took a direct interest in the four principal episodes of his time in the Near East; namely, the Crimean War, and the questions of the Danubian Principalities, the Lebanon, and the Suez Canal.

The Emperor's Near Eastern policy had in its larger aspects a double significance. In the first place, he made conscious efforts to continue the traditional French policy in the Near East, to protect French prestige there from infringement, and at times to increase such French influence. In the second place, while politically but not personally he upheld the principle of the integrity of the Ottoman Empire, he championed the nationalistic desires of certain groups of subject peoples.

In brief, the principal phases of the Near Eastern policy of the Emperor Napoleon III consisted in the participation in a war to protect Turkey from Russian encroachment; the championship of the nationalistic desires of the inhabitants of the Danubian Principalities regarding "union;" the extension of protection to the Maronites by means of armed intervention, and the furtherance of their desires for a native prince; and finally, the moral and at times, diplomatic support of the Suez Canal enterprise.

EDUCATIONAL CAREER

A.B., Greenville College, 1926

A.M., University of Illinois, 1927

Fellow in History, University of Illinois, 1927-1928

Instructor in History, Greenville College, Summer Session, 1928

Assistant in History, University of Illinois, 1928-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

ARTHUR DAVID MOINAT

FOR THE

Degree of Doctor of Philosophy

Friday, May 23, 1930, 2 p. m.
Room 155 Natural History Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF

Committee in Charge:

- Professor Charles F. Hottes, Chairman
- Professor William L. Burlison
- Professor Herman B. Dorner
- Professor Raymond S. Smith
- Professor Frank L. Stevens

OUTLINE OF STUDIES

Major Subject: Botany
Minor Subject: Agronomy

Thesis: AVAILABLE WATER AND THE WILTING OF PLANTS

SUMMARY

1. The stage of wilting known as permanent wilting is not necessarily a criterion of the critical point in soil moisture usually designated as the wilting coefficient.

2. Determinations of the distribution of moisture in the different regions of the bean seedling show that a fairly large proportion of the water in the plant is to be found in the lower part of the hypocotyl. In wilting, the transpiring leaves draw upon the water in the stem as soon as the supply from the roots is cut off.

3. Plants apparently permanently wilted, which had been cut at the soil surface, revived as many as 3 or 4 times when tested in the moist chamber. The results would indicate that in the stages of wilting just preceding permanent wilting the plants are using stored water from their own tissues more than they are from the soil. Therefore the critical point for soil moisture may have been reached some time previous to permanent wilting.

4. Moisture determinations on numerous bean seedlings at permanent wilting indicated that the water content at that stage in wilting is lower for plants grown at low soil moistures than for those grown in soils with higher moisture contents.

5. The mechanical tissue per unit of leaf area was found to be greater in plants grown in soil at lower moisture contents. Thus leaves from such plants have greater mechanical rigidity and the water content is not indicated as quickly by the wilting of the leaf blade.

6. Water culture plants with roots adapted to tap water were wilted by adding to this water 0.08 M. of NaCl. A concentration of 0.07 M. NaCl very rarely produced wilting.

EDUCATIONAL CAREER

B.S., Colorado Agricultural College, 1924

M.S., Oregon State Agricultural College, 1925

Assistant in Botany, University of Illinois, 1927-1929

Fellow in Botany, University of Illinois, 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

SIDNEY LIONEL NEAVE

FOR THE

Degree of Doctor of Philosophy

Thursday, May 1, 1930, 9 A. M.
Room 456, Chemistry Building

Committee in Charge:

Professor Arthur M. Buswell, Chairman
Professor Ralph L. Shriner
Professor G. Frederick Smith
Professor Fred W. Tanner
Professor Leonard F. Yntema

Outline of Studies

Major Subject: Chemistry (Sanitary)
Minor Subject: Bacteriology

Thesis: CHEMICAL STUDIES ON SLUDGE DIGESTION

SUMMARY

The anaerobic degradation of some of the dominant constituents of sewage sludge has been studied with reference to the fate of these substances in the sludge digestion process.

The major nitrogenous components were shown to be urea, nucleoproteins and simple proteins, and their degradation products. Rapid hydrolysis of urea to ammonium carbonate was demonstrated. Proteins hydrolyzed and peptized rapidly at pH 6.4 but slowly at pH 5.0. The more alkaline digestion yielded fatty acids, ammonia and free amino acids as products. The purine fraction of the nucleoproteins suffered complete destruction. In acid sludges, proteolysis was arrested and odorous amines produced: also the solids retained their hydrophilic properties.

Grease was shown to be an important sludge component in that it digested to lower fatty acids; the lower acids then yielded methane and carbon dioxide.

For the fatty acid degradation, an anaerobic oxidative mechanism has been demonstrated in which water acts as the oxidizing agent.

EDUCATIONAL CAREER

A.B., University of Illinois, 1924

A.M., University of Illinois, 1926

Chemist, Illinois State Water Survey, 1920-1927

Assistant in Chemistry, University of Illinois, 1928-1929

Chemist, Illinois State Water Survey, and Chemical Foundation Fellowship, 1929-1930

PUBLICATIONS

Solubility and Rate of Solution of Gases. A Bibliography: Ill. State Water Survey, Bulletin *19,* 49 pp. (1924).

Determination of Chlorides in Salt Brines: Journal Industrial and Engineering Chemistry, Analytical, *2,* 28 (1930).

With A. M. Buswell:

- Note on the occurrence of Bacteria in Oil-Well Brine Samples: Journal Bacteriology, *12,* 133-134 (1926).
- Some Chemical Characteristics of Sewage Sludge: Journal Industrial and Engineering Chemistry, *19,* 233 (1927).
- Fate of Grease in Sludge Digestion: Journal Industrial and Engineering Chemistry, *19,* 1012 (1927).
- The Significance of Nitrogen Determinations in Sanitary Analysis: Journal American Water Works Association, *17,* 388-395 (1927).
- A Résumé of the Problem of Nitrogen Losses Through Denitrification: Soil Science, *24,* 285-290 (1927).
- Treatment and Disposal of Distillery Slop by Anaerobic Digestion Methods: Journal Industrial and Engineering Chemistry, *20,* 837 (1928).
- Alkaline Digestion of Sewage Grease: Journal Industrial and Engineering Chemistry, *20,* 1368 (1928).
- Biological Data on a Sprinkling Filter: Illinois State Water Survey, Bulletin *26,* 95-100 (1928).

With A. M. Buswell and A. A. Brensky:

- Chemical and Biological Reactions in the Dorr-Peck Tank: American Journal Public Health, *12,* 299-310 (1922).

With G. I. Wallace:

- The Nitrite Test as Applied to Bacterial Cultures: Journal of Bacteriology, *14,* 377-384 (1927).

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

PETER NELSON

FOR THE

Degree of Doctor of Philosophy

Monday, May 26, 1930, 9 a. m.
Room 212 Commerce Building

THE LIBRARY OF THE
MAY 24 1930

Committee in Charge:

Professor Nathan A. Weston, Chairman
Professor Edward Berman
Professor Harold C. M. Case
Professor Laurence J. Norton
Professor Charles L. Stewart

OUTLINE OF STUDIES

Major Subject: Economics

First Minor Subject: Agricultural Economics

Second Minor Subject: Farm Organization and Management

Thesis: A HISTORY OF AGRICULTURE IN ILLINOIS WITH SPECIAL REFERENCE TO TYPES OF FARMING

Summary

Differentiation in types of farming began in Illinois slightly more than a century ago. Little diversity in farming types was evident at this early date. But with economic development in other lines of industry the agriculture of the state progressed from simple self-sufficing frontier systems of farming to modern types based on scientific business methods. Prior to the middle of the last century types of farming were differentiated mainly on the basis of distance from navigable streams. Shortly after that time railroad transportation grew in importance and with it farming systems gradually distributed themselves on the basis of climatic differences, productivity of the land, as well as availability of the market. This evolution, although retarded at certain times and accelerated at others, has in general been a slow continuous process. In spite of the fact that the size and therefore the importance of farm enterprises fluctuate to a considerable extent with changes in market prices of farm products, types of farming in this state have been modified more in response to unfavorable conditions for the waning enterprises over a long period of time. For nearly forty years eight farming-type areas, which have retained the same geographical location with slight modifications, have characterized the agriculture of the state. The passing of the horse, the extension of hard roads, and the adoption of automotive power indicate, however, that an adequate description of types of farming in Illinois will soon require considerable readjustment in farming-type areas.

EDUCATIONAL CAREER

B.S., Utah Agricultural College, 1920

M.S., Utah Agricultural College, 1924

Assistant in Farm Organization and Management,
University of Illinois, 1926-1928

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

WILLIAM ABNER NICHOLS

FOR THE

Degree of Doctor of Philosophy

Friday, May 23, 1930, 3 p. m.
Room 456, Chemistry Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF

Committee in Charge:

- Professor Worth H. Rodebush, Chairman
- Professor Reynold C. Fuson
- Professor Charles T. Knipp
- Professor Carl S. Marvel
- Professor Thomas E. Phipps

OUTLINE OF STUDIES

Major Subject: Chemistry (Physical)
First Minor Subject: Organic Chemistry
Second Minor Subject: Physics

Thesis: I. THE CHEMICAL PROPERTIES OF ATOMIC OXYGEN

II. AN ATTEMPT TO MEASURE NUCLEAR MOMENTS

Summary

I.

Atomic oxygen was prepared by the electrodeless ring discharge method. The action of a beam of these atoms on various metallic oxides was studied. Any reaction taking place was oxidizing in character except in the case of molybdenum trioxide. Here reduction, similar to that produced by atoms of hydrogen, took place. Atomic oxygen was also prepared by thermal dissociation at the surface of a heated platinum filament. This active species oxidized a wide variety of substances.

II.

Beams of hydrogen iodide, iodine and water molecules were passed thru an inhomogeneous magnetic field in an attempt to get a broadening due to the nuclear moment of the molecules. No such broadening was observed. A deflection of the entire beam, away from the knife-edge, was noted. This has not, as yet, been satisfactorily explained.

EDUCATIONAL CAREER

A.B., Oberlin College, 1925

Graduate Assistant, Oberlin College, 1925-1927

M.A., Oberlin College, 1927

Assistant in Chemistry, University of Illinois, 1927-1929

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

WILLIAM THEODORE PENFOUND

FOR THE

Degree of Doctor of Philosophy

Friday, December 19, 1930, 10 a. m.
Room 216 Natural History Building

THE LIBRARY OF THE
DEC 16 1930
UNIVERSITY OF ILLINOIS.

Committee in Charge:

Professor Arthur G. Vestal, Chairman
Professor John T. Buchholz
Professor Charles F. Hottes
Professor Bjorn T. Palm
Professor Victor E. Shelford

OUTLINE OF STUDIES

Major Subject: Botany (Plant Ecology)
First Minor Subject: Systematic Botany
Second Minor Subject: Animal Ecology

Thesis: PLANT ANATOMY AS CONDITIONED BY LIGHT INTENSITY AND SOIL MOISTURE

SUMMARY

Plants grown in full sunlight differed in structure from those grown in shade as follows:

The roots showed more secondary thickening and a greater total diameter.

The hypocotyls had a greater percentage of xylem, and increased diameter, and more numerous and thicker-walled mechanical elements.

The regions, notably the xylem, in the internodes were deeper and the total diameter was thus much greater.

All regions in the mesophyll and midvein had greater dimensions thus giving the leaf greater thickness.

Plants grown in soil of high water content differed in structure from those grown in dry soil as follows:

The roots showed more secondary thickening, more and larger water-conducting vessels, and an increased total diameter.

The hypocotyls showed a higher percentage area of xylem, a larger size of all component cells, and more and thicker-walled mechanical elements.

The internodes had a greater depth of all regions, a greater percentage area of xylem, a larger size of all cells, and more and thicker-walled phloem fibers.

All regions in the mesophyll and midvein had greater dimensions and thus both the mesophyll and midvein were thicker.

EDUCATIONAL CAREER

A.B., Oberlin College, 1922

A.M., University of Illinois, 1924

Assistant in Botany, University of Illinois, 1923-1924, 1925-1927

Assistant Professor of Botany, Iowa State Teachers College, 1924-1925

Assistant Professor of Botany, Tulane University, 1927-1930

PUBLICATIONS

McDougall, W. B., and Penfound, W. T. 1928. Ecological anatomy of some deciduous forest plants. Ecology, 9:85-91.

Solheim, W. G., and Penfound, W. T. 1928. A study of the algae of a freshwater stream. Trans. Ill. State Acad. Sci., 20:85-91.

Penfound, W. T., Efron, B. G., and Morrison, J. J. 1930. A survey of the herbaceous plants of New Orleans in relation to allergy. Journal of Allergy, 1:369-375.

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

McKENDREE PETTY

FOR THE

Degree of Doctor of Philosophy

Thursday, May 8, 1930, 3 p. m.
Room 216 Lincoln Hall

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

Professor Arthur Hamilton, Chairman
Professor David H. Carnahan
Professor Thomas E. Oliver
Professor William S. Robertson
Professor Julio J. Rueda

Outline of Studies

Major Subject: Romance Languages (Spanish)
First Minor Subject: French
Second Minor Subject: Latin American History

Thesis: SOME EPIC IMITATIONS OF ERCILLA'S *LA ARAUCANA*

SUMMARY

The works examined in this study are the *Arauco Domado* of Pedro de Oña, *La Araucana, Cuarta y Quinta Partes* by Santisteban Osorio, *Las guerras de Chile* attributed to Juan de Mendoza Monteagudo, and the *Purén Indómito* of Álvarez de Toledo. Using Alonso de Ercilla's *La Araucana* as a basis of comparison, the above works were examined and analysed for the purpose of determining in what way they are imitative of Ercilla's work and wherein they differ from same. Another objective was to derive certain general characteristics common to all epic poems written on the Araucanian theme. The following conclusions were drawn:

1. The *Arauco Domado* of Pedro de Oña, written to glorify Don García Hurtado de Mendoza, covers part of the plot of *La Araucana,* but treats those same episodes from a different point of view. The rhyme scheme is different. Oña's skill in the handling of language enabled him to expand and work over the Ercillan material to suit his purpose and, to a certain extent, conceal his borrowings. His imitation of the externals of *La Araucana,* his haste, and the spirit of adulation and flattery that pervades the entire poem, make it highly artificial and insipid.
2. In *La Araucana, Cuarta y Quinta Partes,* Santisteban Osorio, a youth of little or no ability except in the conventional technique of versification, attempted to finish the work that Ercilla had begun. The result was a conglomeration of artificiality, insipidity and general silliness that robs it of any literary value whatever.
3. The authors of *Las guerras de Chile* and the *Purén Indómito* used the Ercillan method to write rhymed chronicles of the wars between the Spanish colonists and the Araucanian Indians. The style of the *Purén Indómito* is almost equal in vigor to that of Ercilla's poem.
4. Alonso de Ercilla proved superior to the other poets under consideration because he alone seemed to possess the true artistic spirit necessary for the task he undertook to perform. He wrote of what he himself had seen, experienced and felt. He spent years polishing and revising his verses before allowing them to be published. He possessed a keen appreciation of the dramatic and the ability to paint in vivid colors the psychological and emotional phases of that epic struggle of which he wrote. A comparison of his style with that of the other imitating poets shows that where the latter are weak, artificial and shallow, Ercilla is both dynamic and profound. The other poets imitated *La Araucana* in technique, general organization and the non-essentials. They failed because they could not imitate its spirit.

EDUCATIONAL CAREER

A.B., University of Vermont, 1916

M.A., Northwestern University, 1923

Taught in South America, 1916-1920

Instructor in Spanish and graduate student, Northwestern University, 1920-1925

Graduate student summer quarter of 1925, University of Chicago

Assistant in Spanish and graduate student, University of Illinois, 1925-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

LUCY WESTON PICKETT

FOR THE

Degree of Doctor of Philosophy

Thursday, May 29, 1930, 2 p. m.
Room 456 Chemistry Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

- Professor George L. Clark, Chairman
- Professor Duane T. Englis
- Professor Charles T. Knipp
- Professor John H. Reedy
- Professor Worth H. Rodebush

OUTLINE OF STUDIES

Major Subject: Chemistry (Analytical)
First Minor Subject: Physical Chemistry
Second Minor Subject: Physics

Thesis: I. THE EFFECT OF X-RAYS ON CHEMICAL REACTIONS

Summary

An investigation of the effect of x-rays on a number of systems showed that the resulting chemical action was small in all cases, but greatest in those reactions which involved oxidation and reduction in aqueous solution. A comparison of the oxidation of potassium iodide in the presence and absence of oxygen led to the conclusion that the formation of hydrogen peroxide as a preliminary step was a possible but not a necessary mechanism for these changes. Neither simultaneous irradiation by ultraviolet light nor the presence of colloidal lead made the x-radiation more effective in producing chemical change.

A study of the energy relations in the photolysis of potassium nitrate showed that approximately one molecule reacted for every four ion pairs formed in solution and hence that less than 1% of the energy of the radiation was utilized in the chemical decomposition.

II. AN X-RAY STUDY OF THE STRUCTURE OF ORGANIC COMPOUNDS

The crystal structures of diphenyl, dimesityl, two active forms of 3, 3′–diaminodimesityl, hexachlorodiphenyl, diphenic acid, and o–tolidine were determined by x-ray diffraction methods. From the data, the most probable size, shape and position of the molecules were calculated. It was concluded that in the 2, 2′, 6, 6′ derivatives of diphenyl the benzene rings are staggered and turned at a slight angle to each other.

EDUCATIONAL CAREER

B.A., Mount Holyoke College, 1925

M.A., Mount Holyoke College, 1927

Carr Fellow in Chemistry, University of Illinois, 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

HARRY EDWARD PRATT

FOR THE

Degree of Doctor of Philosophy

Thursday, May 22, 1930, 2 p. m.
Room 108 Administration Building

THE LIBRARY OF THE
MAY 24 1930
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Committee in Charge:

- Professor James G. Randall, Chairman
- Professor Clarence A. Berdahl
- Professor Edward H. Cameron
- Professor Albert H. Lybyer
- Professor William S. Robertson
- Professor Frederick S. Rodkey

OUTLINE OF STUDIES

Major Subject: History
First Minor Subject: Education
Second Minor Subject: Political Science

Thesis: DAVID DAVIS, 1815-1886

SUMMARY

David Davis (1815-1886) was born of Welsh parents in Cecil County, Maryland. He attended Newark Academy and graduated from Kenyon College in 1832 and later studied law in Lenox, Massachusetts, and at Yale College, settling in Bloomington, Illinois, in 1836. In 1844 he was elected as a Whig to the State Legislature, and in 1847 was a member of the State Constitutional Convention. From 1848-1862 he was a judge of the Eighth Judicial Circuit in Illinois where he became a close friend of Abraham Lincoln who as a lawyer traveled this circuit. In 1860 Davis took charge of the Lincoln forces in the Chicago Convention and was instrumental in securing Lincoln's nomination through promises of cabinet positions to "favorite sons."

In the summer of 1861 he served on the Board of Visitors to the United States Military Academy and later in the year was chairman of a committee to investigate war claims in the Western Department at St. Louis. From 1862 to 1877 he was associate justice of the United States Supreme Court. His opinion in the case of *Ex parte Milligan* is considered a bulwark of American liberty, the Court deciding that the President had no power to institute trial by military tribunal during war in localities where the civil courts were open.

In 1872 he was nominated for President by the National Labor Reform Party, but his failure to get the nomination from the Liberal Republican party caused him to withdraw from the Presidential contest. From 1877-1883 he was in the United States Senate and succeeded Chester A. Arthur as President of that body in 1881. He was an Independent in the Senate, but acted mainly with the Democrats until 1881, thereafter voted mainly with the Republicans. In 1885 he was President of the Illinois State Bar Association. He died in Bloomington, Illinois, in June, 1886.

This study is in large part a pioneer work, no previous biography or collection of his letters has been made. Over 200 of Davis's letters have been collected and used, and 450 letters of Wm. W. Orme, Ward H. Lamon, and Leonard Swett were used for the first time. New facts and conclusions on Davis's career include his unsuccessful attempt to become prosecuting attorney of the Eighth Judicial District in 1839, his land dealings, his part and that of Mrs. Lincoln in the formation of Lincoln's Cabinet, the efforts made to place him in the United States Supreme Court, his work in the settlement of Lincoln's estate, his personal views on the Milligan Case, and his attitude toward the Electoral Commission.

EDUCATIONAL CAREER

B.S., University of Illinois, 1923
M.S., University of Illinois, 1926

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

JESSE RAYMOND PURDY

FOR THE

Degree of Doctor of Philosophy

Monday, January 27, 1930, 7 p. m.
Room 254 Mathematics Building

COMMITTEE IN CHARGE:

Professor ROBERT D. CARMICHAEL, Chairman
Professor ARTHUR B. COBLE
Professor JAKOB KUNZ
Professor ALFRED J. MARIA
Professor GEORGE A. MILLER

OUTLINE OF STUDIES

Major Subject: Mathematics
First Minor Subject: Geometry
Second Minor Subject: Physics

Thesis: THE TREATMENT OF FINITE INTEGRATION BY MEANS OF THE CAUCHY INTEGRAL THEOREM

SUMMARY

The equations

$$F(x+1) - F(x) = A(x),$$
$$G(x+1) + G(x) = A(x),$$

are solved when $A(x)$ is analytic in every finite part of a suitable infinite region R, and is bounded in R by C exp. $k|x|$, where k is any positive constant. The solutions are expressed as integrals along an infinite path lying in R, of functions involving solutions of certain linear differential equations with constant coefficients, in connection with given periodic functions. The solutions possess properties which make them definite except for polynomials of known maximum degree in simple exponentials.

The method is extended to give new solutions of the above equations when $A(x)$ is any entire function. The solutions obtained for this case are expressed as infinite series of polynomials in x and polynomials in simple exponentials.

EDUCATIONAL CAREER

B.S., Kenyon College, 1923

A.M., Kenyon College, 1925

A.M., University of Illinois, 1927

Assistant in Mathematics, University of Illinois, 1925-1929

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

JOSEPH RETZ RAMSER

FOR THE

Degree of Doctor of Philosophy

Thursday, May 22, 1930, 3 p. m.
Room 212 Commerce Building

THE LIBRARY OF THE
MAY 24 1930

Committee in Charge:

- Professor Maurice H. Robinson, Chairman
- Professor Merlin H. Hunter
- Professor Frederic E. Lee
- Professor Hiram T. Scovill
- Professor Nathan A. Weston
- Professor Ivan Wright

Outline of Studies

Major Subject: Economics (Finance)
First Minor Subject: Economic Theory
Second Minor Subject: Accountancy

Thesis: SOME ASPECTS OF LONG TERM DEBT FINANCING IN AGRICULTURE DURING THE YEARS 1920-1928 INCLUSIVE

The life insurance companies, the Federal Land banks and the Joint Stock Land banks are furnishing approximately three and one-half billion dollars of mortgage credit to the agricultural industry in the United States. During the last decade the farm loan business of these institutions has reflected the generally unsatisfactory conditions which have existed in the agricultural industry. The rapid and continuous decline which has taken place in farm real estate values during this period has progressively decreased the equity behind the farm mortgage loan. The amount of farm mortgage loans outstanding has declined in both the life insurance companies and the Federal Farm Loan System.

From the standpoint of the life insurance companies, there have been three principal factors which have contributed to the decline in the amount of their farm mortgage holdings: (1) The unsatisfactory condition of agriculture. (2) The competition of the Federal Farm Loan System with its privilege of raising capital through the issuance of tax exempt securities. (3) The general price decline in the bond market during 1928 and 1929 has made it possible for the life insurance companies to buy other securities on an attractive basis. In spite of these conditions, however, a few of the large life insurance companies, particularly those who make their loans direct, are increasing their farm loans.

The successful operation of the Federal Farm Loan System depends upon the ability of the land banks to market their bonds in accordance with the regulations laid down by the Federal Farm Loan Board. In their efforts to raise capital, the land banks have had to contend with two particularly unfavorable factors: (1) The high interest rates that ruled in the money market for the years of 1928 and 1929 made it difficult to sell bonds on a satisfactory basis. (2) The particularly unfavorable conditions in some of the Joint Stock Land banks beginning with the receiverships in 1927 has had the tendency of discrediting the entire Farm Loan System in the investor's mind and has added additional difficulties to the sale of bonds. In view of the fact that the most serious defects in the Farm Loan System have been found in the Joint Stock Land banks, it is apparent that many difficulties would have been avoided if the Federal Farm Loan Act had provided for only a single system of banks following the plan of the Federal Land banks. As long as it is possible for some of the Joint Stock Land banks to be forced into the hands of receivers, such a condition will have a damaging effect on the entire Farm Loan System even though a large number of the individual banks present a successful record of operations.

EDUCATIONAL CAREER

B.S., University of Illinois, 1924

M.S., University of Illinois, 1925

Assistant in Accountancy, University of Illinois, 1924-1927

Assistant in Economics, University of Illinois, 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

CARL ELMER ROSENQUIST

FOR THE

Degree of Doctor of Philosophy

Tuesday, May 6, 1930, 8 A. M.
Room 110, Agricultural Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

Professor Clyde M. Woodworth, Chairman
Professor William L. Burlison
Professor Ernest E. DeTurk
Professor Charles F. Hottes
Professor Raymond S. Smith

OUTLINE OF STUDIES

Major Subject: Agronomy
Minor Subject: Botany

Thesis: HYBRID VIGOR IN WHEAT (*Triticum vulgare*)

SUMMARY

1. In order to study the degree and prevalence of hybrid vigor consequent upon crossing pure lines of common wheat, F_1 hybrids and their parents were grown side by side and compared in the following characters: (1) date in pollen, (2) date ripe, (3) tillers per plant, (4) tillers bearing spikes, (5) barren spikes per plant, (6) plant height in inches, (7) plant weight, (8) spike weight, (9) grain weight. In making these comparisons a total of 26 different crosses including 1590 hybrid and 2692 parent plants, was studied during the 3-year period 1927-1929.

2. Data taken upon individual plants grown 4 inches apart in the row showed earliness, high tillering ability, numerous spikes per plant, tallness, high yield per plant, high spike yield, and high grain yield to be partially dominant over low values for these characters. Partial dominance of these characters was considered a mark of hybrid vigor.

3. Enough F_1 crossed seed of 13 different crosses was produced in 1928 to plant a rod row spaced 4 inches and also to plant from ⅕ to 2⅕ rod rows spaced 1 inch apart in the row. Observations of hybrids and parents grown in this 1-inch spacing plot revealed no pronounced examples of hybrid vigor, but differences observed and measured resembled rather those which would be found in a similar plot planted to different varieties.

4. Some degree of increase in F_1 above the parental average or above the higher parent was a fairly common phenomenon. The magnitude of this increase, however, was seldom sufficient to be significant. Of the 26 crosses studied 16, or 61 percent, were consistently better than the parental average while 9 or 35 percent were better than the higher parent in all characters studied.

5. Decreases below the parental average or below the low parent were often shown by the F_1 hybrids. Four, or 15 percent, of the 26 crosses studied were consistently poorer than the parental average in all characters except plant height. The hybrid was poorer than the low parent in 6 percent of the total instances.

6. A study of the immediate effect of foreign pollen on average weight of crossed kernels revealed no hybrid vigor of sufficient magnitude to be significant. A total of 107 crosses, including 850 spikes which produced 7527 selfed and 5730 crossed kernels, was used in making the comparisons. Crossed kernels when produced on the same spikes as selfed kernels, averaged 8 percent smaller and when produced on different spikes 10 percent smaller than selfed kernels.

7. In general these experiments indicate that the degree and frequency of hybrid vigor consequent upon crossing pure lines of common wheat, was relatively low.

EDUCATIONAL CAREER

B.S., University of Nebraska, 1924

M.S., University of Nebraska, 1926

Assistant in Agronomy, University of Nebraska, 1924-1926

Assistant in Plant Breeding, University of Illinois, 1926-1927

Instructor in Agricultural Botany, University of Nebraska, 1927-1929

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

SWANIE SIGUARD ROSSANDER

FOR THE

Degree of Doctor of Philosophy

Monday, May 19, 1930, 2 p. m.
Room 456 Chemistry Building

THE LIBRARY OF THE
MAY 24 1930

Committee in Charge:

- Professor Carl S. Marvel, Chairman
- Doctor Ludwig F. Audrieth
- Professor Charles T. Knipp
- Professor Ralph L. Shriner
- Professor Leonard F. Yntema

OUTLINE OF STUDIES

Major Subject: Chemistry (Organic)
First Minor Subject: Inorganic Chemistry
Second Minor Subject: Physics

Thesis: HEXA-SUBSTITUTED ETHANES

SUMMARY

Diphenyl–tetra–tertiary–butylethynylethane has been prepared and found to be completely associated at room temperature. It is cleaved by 40 per cent sodium amalgam, but not by one per cent amalgam.

The stability towards cleavage by alkali metals has shown the ethane linkage in diphenyl–tetra–tertiary–butylethynylethane to be intermediate between the corresponding linkages in hexa–tertiary–butylethynylethane and tetraphenylethane.

A synthesis for tetra–cyclohexyl–diphenylethane is described. It was found to be unstable toward heat and light. One per cent sodium amalgam cleaved its ethane linkage. Its solution absorbed oxygen forming stable dicyclohexylphenylmethyl peroxide.

The cyclohexyl grouping has been found to have about the same dissociating effect as the unsaturated benzenoid nucleus.

EDUCATIONAL CAREER

B.S., Tarkio College, 1924

M.A., University of Illinois, 1928

Assistant in Chemistry, University of Illinois, 1926-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

KARL MYRON SCOTT

FOR THE

Degree of Doctor of Philosophy

Saturday, October 25, 1930, 9 a. m.
Room 209, Commerce Building

THE LIBRARY OF THE
OCT -3 1930
UNIVERSITY OF ILLINOIS.

Committee in Charge:

- Professor Edward Berman, Chairman
- Professor Harold C. M. Case
- Professor Merlin H. Hunter
- Professor Charles L. Stewart
- Professor Nathan A. Weston
- Professor Ivan Wright

Outline of Studies

Major Subject: Economics

First Minor Subject: Economic Theory

Second Minor Subject: Farm Organization and Management

Thesis: THE COAL INDUSTRY AND THE COAL MINERS' UNIONS IN THE UNITED STATES SINCE THE WORLD WAR

SUMMARY

The coal industry in the United States suffered from increasing inefficiency after the World War. Over-development, irregularity of operation, recurrent coal shortages, and industrial disputes became more and more serious. The United Mine Workers, as an organization, carried out policies which intensified this inefficiency. The maintenance of the wage level of 1919 in the strongly unionized fields until 1927 enabled the producers in the non-union fields to gain the coal markets of the country and caused the further over-development of the industry. With the growing advantages of non-union operation under lower wage scales than those maintained by the United Mine Workers in the organized fields, additional inducements for the elimination of the union developed. As a consequence the organization lost control over most of the laborers in the industry. Various proposals, ranging from a continued reliance upon competition to complete nationalization, have been advanced, but little has been accomplished. A portion of the union's membership, seeking means to rehabilitate unionism in the industry, repudiated the established union's policies in 1930 and created a new United Mine Workers. The future of unionism in the coal industry appears to depend upon the success of this organization.

EDUCATIONAL CAREER

A.B., University of Arkansas, 1925

M.S., Iowa State College, 1926

Assistant in Economics, University of Illinois, 1927-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

PIERCE WILSON SELWOOD

FOR THE

Degree of Doctor of Philosophy

Tuesday, August 5, 1930, 3 p. m.
Room 162 Chemistry Building

THE LIBRARY OF THE
SEP 20 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

- Professor B. Smith Hopkins, Chairman
- Professor Duane T. Englis
- Professor Charles T. Knipp
- Professor John H. Reedy
- Professor Leonard F. Yntema

OUTLINE OF STUDIES

Major Subject: Chemistry (Inorganic)
First Minor Subject: Analytical Chemistry
Second Minor Subject: Physics

Thesis: OBSERVATIONS ON THE RARE EARTHS: ABSORPTION AND REFRACTION OF CERTAIN RARE EARTH SALTS

SUMMARY

Deformation of the electron shells of the neodymium ion has been investigated from the standpoints of absorption and refraction changes. The refraction of neodymium perchlorate and nitrate shows an increase with concentration, while the chloride shows a decrease. The absorption bands show a slight shift toward the red. These results show that the outer electron shell of the neodymium ion must be deformed by the approach of the negatively charged anion in concentrated solution, and that this deformation is communicated in part to the inner electron shells thought to be the source of the characteristic absorption bands. Results are also given on the absorption spectra of praseodymium, samarium, europium, gadolinium, holmium, and erbium.

EDUCATIONAL CAREER

B.A., University of British Columbia, 1927

A.M., University of Illinois, 1928

Assistant in Chemistry, University of Illinois, 1928-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

EVERETT JESSE SHAW

FOR THE

Degree of Doctor of Philosophy

Friday, January 24, 1930, 8 A.M.
Room 162 Chemistry Building

Committee in Charge:
- Professor Thomas E. Phipps, Chairman
- Professor Reynold C. Fuson
- Professor Charles T. Knipp
- Professor G. Frederick Smith
- Professor Leonard F. Yntema

OUTLINE OF STUDIES

Major Subject: Chemistry (Physical)
First Minor Subject: Organic Chemistry
Second Minor Subject: Physics

Thesis: A STUDY OF THE MAGNETIC PROPERTIES OF THE DIATOMIC SULFUR MOLECULE

SUMMARY

Diatomic sulfur was subjected to the Stern-Gerlach molecular ray method of determining magnetic properties. No deflection of the beam was obtained in the magnetic field. This result indicates that the diatomic sulfur molecule is probably a^{1}S molecule. However, this conclusion cannot be considered as certain until the molecular ray method has been applied to molecules of known ground state, or until the band spectrum of diatomic sulfur has been completely analyzed.

EDUCATIONAL CAREER

B.S., University of Illinois, 1926

Scholar in Chemistry, University of Illinois, 1926-1927

Fellow in Chemistry, University of Illinois, 1928-1929

Assistant in Chemistry, University of Illinois, 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

MARY LUCILLE SHAY

FOR THE

Degree of Doctor of Philosophy

Thursday, May 22, 1930, 4 p. m.
Room 108 Administration Building

THE LIBRARY OF THE
MAY 24 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

Professor Albert H. Lybyer, Chairman
Professor Clarence A. Berdahl
Professor Marcus L. Hansen
Professor Laurence M. Larson
Professor Theodore C. Pease
Professor William S. Robertson
Professor Joseph W. Swain

OUTLINE OF STUDIES

Major Subject: History (European)
First Minor Subject: History
Second Minor Subject: International Law

Thesis: THE OTTOMAN EMPIRE FROM 1730 TO 1734 AS REVEALED IN THE DESPATCHES OF ANGELO EMO, VENETIAN *BAILO*

SUMMARY

The despatches of Angelo Emo contain two kinds of historical material: descriptions of Turkish customs and of Venetian diplomatic procedure, which had become fixed; and an account of the events and conditions in the Ottoman Empire from 1730 to 1734. The first kind of material is of no great general significance. A study of the second kind of material reveals from the outset the instability of the Turkish government as shown in the revolt of September 28, 1730, the minor revolt of March, 1731, the rumors of other revolts, the almost constant rebellious mutterings, and the frequent dismissals of officials. The outstanding feature of the Turkish-Venetian political relations was the renewal of the Treaty of Passarowitz as one of "perpetual peace." Otherwise these relations were of minor importance as compared with those which developed from the war with Persia, which continued throughout the period of Emo's service, with Russia as that Power sought to expand in Asia and intervened in Polish affairs, with Austria as a traditional enemy of the Porte and an ally of Russia, and with France who had replaced Venice as the most influential Power at the Porte and who sought an alliance with Turkey against Austria and Russia. The internal disturbances and the war with Persia were too great a drain upon Turkish resources to permit of the Porte's having a more aggressive foreign policy than that maintained from 1730 to 1734, but the ill-feeling that developed during these years was one of the major causes for the Turkish war against Russia and Austria from 1736 to 1739.

EDUCATIONAL CAREER

A.B., University of Illinois, 1917

Scholar in History, University of Illinois, 1924-1925

A.M., University of Illinois, 1925

Graduate Student, American Academy in Rome, Italy, 1926

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

GEORGE MYRON SHEAR

FOR THE

Degree of Doctor of Philosophy

Tuesday, May 20, 1930, 8 a. m.
Room 155 Natural History Building

THE LIBRARY OF THE
MAY 24 1930

Committee in Charge:

- Professor Charles F. Hottes, Chairman
- Professor William L. Burlison
- Professor Herman B. Dorner
- Professor Warren A. Ruth
- Professor Frank L. Stevens

OUTLINE OF STUDIES

Major Subject: Botany
Minor Subject: Horticulture

Thesis: STUDIES ON INANITION IN ARACHIS AND PHASEOLUS

Summary

1. Peanut embryos growing at room temperature in darkness on sterile agar are capable of living more than four months. They cease elongation in about four weeks and lose their ability to form chlorophyll after six weeks.

2. Seedlings of peanuts whose cotyledons have been removed after six days growth will form chlorophyll for a longer time than will seedlings of beans similarly treated. The gradual decrease in the intensity of greening is accompanied by a decrease in the amount of yellow pigment.

3. Embryos of peanuts live longer and form chlorophyll for a longer time than seedlings of similar plants in which inanition has been induced by removal of the cotyledons after active growth has started.

4. The per cent of shoot length to total length and shoot weight to total weight in starving peanuts was found to be greater than for check plants. This relationship is just the reverse for beans. A very close correlation exists between the per cent shoot weight to total weight of starving peanuts and beans grown at 23° C.

5. Starving seedlings of peanuts utilize their oil reserve more economically than the checks. After the first six days of inanition they were unable to maintain the regular fluctuations in the per cent of oil that was shown by the check seedlings.

EDUCATIONAL CAREER

B.S., University of Maryland, 1927

M.S., University of Illinois, 1928

Assistant in Botany, University of Illinois, 1927-1929

Fellow in Botany, University of Illinois, 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

GEORGE WILLIAM STARCHER

FOR THE

Degree of Doctor of Philosophy

Friday, May 9, 1930, 4 p. m.
Room 254 Mathematics Building

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MAY 24 1930
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Committee in Charge:

Professor Robert D. Carmichael, Chairman
Professor Arthur R. Crathorne
Professor Jakob Kunz
Professor Harry Levy
Professor George A. Miller

OUTLINE OF STUDIES

Major Subject: Mathematics
First Minor Subject: Statistics
Second Minor Subject: Physics

Thesis: ON IDENTITIES ARISING FROM SOLUTIONS OF Q-DIFFERENCE EQUATIONS AND SOME INTERPRETATIONS IN NUMBER THEORY

Summary

By considering a q-difference equation, with proper restrictions on the coefficients, it can be shown that there exists a unique solution which is analytic in the neighborhood of the point zero, having there the value 1. Such a solution may be expressed in more than one form. Equating the different expressions for such a solution of a given equation gives rise to an identity.

In this paper two linear q-difference equations with linear coefficients are considered. The first is a linear non-homogeneous equation of the first order. The second is a linear homogeneous equation of the second order. A solution of each of these is obtained in the form of simple infinite products, infinite series with simple coefficients, or the product of two or more such expressions. Equating different expressions for a solution gives an identity. By comparing such identities it is shown that many different, equally simple, expressions may represent the same function. Identities involving infinite series and products which appear to be new are exhibited; many well known identities are obtained, and often new proofs for them are afforded; new members are added to some well known identities; and certain identities are given interpretations in number theory.

EDUCATIONAL CAREER

A.B., Ohio University, 1926

A.M., University of Illinois, 1927

Scholar in Mathematics, University of Illinois, 1926-1927

Assistant in Mathematics, University of Illinois, 1927-1929

Fellow in Mathematics, University of Illinois, 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

RALPH HUMPHREYS STIMSON

FOR THE

Degree of Doctor of Philosophy

Monday, October 13, 1930, 4 p. m.
Room 424-A, Library Building

THE LIBRARY OF THE
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UNIVERSITY OF ILLINOIS.

Committee in Charge:

Professor Clarence A. Berdahl, Chairman
Professor Ernest L. Bogart
Professor James W. Garner
Professor Laurence M. Larson
Professor John M. Mathews

OUTLINE OF STUDIES

Major Subject: Political Science
First Minor Subject: International Relations
Second Minor Subject: Economics

Thesis: THE CONTROL OF THE MANUFACTURE OF ARMAMENT

A Study of the Alleged Influence of Armament Industries, Firms, and Interests upon War-Scares, Competition in Armament, and the Outbreak of War

SUMMARY

Parts I to III, inclusive, analyze the meaning and scope of the expressions "armament," "armament interests," and "armament firms and industries." It was discovered that the problem of the manufacture of armament is bound up with the problem of industrial cycles because very few concerns manufacture only specialized armament and the most important of them are balanced armament concerns having an important peace-use manufacturing wing whose fluctuations in conjunction of its armament wing could constitute a variable hunger for orders which in turn could influence fluctuations in pressure on public opinion and governments for armament contracts.

Part IV is an examination of the correlation between the fluctuations of indexes of hunger for orders on the one hand, and indexes of pressure on public opinion and governments, of war-scares, and similar political concomitants of industrial cycles and of the manufacture and sale of armament on the other. Two complete fifty-year cycles were discovered for the United States in the shipbuilding curves, in war-scares and the dates of wars, and in the expenditures and debts of the United States Government, especially the expenditures of the War and Navy Departments. An attempt was made to analyze the larger aspects of this fifty-year cycle. In the shorter fluctuations of shipbuilding curves, some negative correlation was found between merchant vessel and warship building activity, together with the probability that, in recent times, there has been some over-lapping of these two activities which would tend to over-expand shipbuilding facilities and interests.

War-scares and big-navy campaigns tend to occur at times of depression —or probably also of cut-throat competition—in merchant shipbuilding, and in the troughs of warship building. The war-scares tend to occur with reference to foreign states having some approach to naval equality with the home state, and to occur at a time when the ratio of warship building for the home state to warship building for the foreign state is low. Annual, quarterly, and monthly indexes of naval publicity and war-scares were prepared by counting the number of articles listed under various headings in the *Reader's Guide to Periodical Literature* and the *New York Times Index.* Pronounced negative correlation was discovered between naval publicity and pig iron production. Stock price fluctuations were used as the most practicable indexes of hunger for orders on the part of individual concerns. Even more pronounced negative correlation was discovered between the monthly market price range per share of the Bethlehem Steel Corporation common stock and the index of naval publicity. War-scare peaks coincide with naval publicity peaks at many points; and both of these tend to occur, in their shorter fluctuations, just before or during the sessions of Congress. The height of these peaks also bears some relation to the size of the naval authorization laws passed at the sessions at which they occur. Publicity regarding disarmament and disarmament conferences seems to have a significant relation to the war-scare index.

The principal methods used in this study were documentary research and statistical comparison. Most of the statistical data were taken from primary published sources and documents.

EDUCATIONAL CAREER

A.B., Ohio State University, 1921

A.M., Harvard University, 1924

Assistant in Political Science, University of Illinois, 1926-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

IVAN McKINLEY STONE

FOR THE

Degree of Doctor of Philosophy

Tuesday, May 27, 1930, 2 p. m.
Room 424A Library Building

THE LIBRARY OF THE
MAY 24 1930

Committee in Charge:

- Professor James W. Garner, Chairman
- Professor Clarence A. Berdahl
- Professor John A. Fairlie
- Professor John M. Mathews
- Professor James G. Randall

OUTLINE OF STUDIES

Major Subject: Political Science

First Minor Subject: International Law

Second Minor Subject: Constitutional History of the United States

Thesis: THE RELATION OF PETROLEUM TO AMERICAN FOREIGN POLICY

SUMMARY

Although the United States has for years been the dominant force in the world's petroleum industry, fears are expressed by petroleum authorities that American production will relatively soon begin to decline and that this country will to an increasing extent become dependent upon foreign sources of supply. Motivated by the increasing utilization of petroleum and petroleum products, by a growing realization that the world's supplies are not inexhaustible, and by active British competition in the international petroleum field, the American Government, especially since the World War, has energetically supported the efforts of American oil prospectors to penetrate foreign fields. The Government has conducted an exhaustive study of foreign restrictions and discriminations; under the banner of the open door it has intervened for United States nationals in the British mandates of Iraq and Palestine; it has asserted the need for equality of commercial opportunity and of reciprocal access to petroleum resources in the Dutch East Indies; it has questioned allegedly retroactive and confiscatory petroleum legislation and regulations of Mexico. Colombian oil appears to have lubricated the Senate's approval of the Thomson-Urrutia treaty of 1914, and fear that Congress might adopt a tariff on petroleum moved President Harding in 1921 to advise against such action on the ground that an oil duty would jeopardize the success of the Government's efforts on behalf of American petroleum prospectors abroad. American oil diplomacy has been notably successful, but despite the continued interest of both Democratic and Republican administrations in foreign petroleum supplies, the United States can scarcely be said to follow a distinctive foreign oil policy. The State Department has invoked, in the main, the doctrines of the open door and reciprocal access to petroleum supplies, and there has been a marked tendency to deal with oil episodes as they arise. If and when American production begins seriously to decline, more vigorous measures may be found necessary. Cooperation among world leaders in the petroleum industry appears to be increasing, and it is within the realm of possibility that a working solution concerning the control and exploitation of remaining reserves will be formulated with little need for governmental interference.

EDUCATIONAL CAREER

A.B., University of Nebraska, 1923

Instructor in Political Science, University of Nebraska, 1923-1924

Teaching Fellow in Political Science, University of California, 1924-1925

M.A., University of Illinois, 1926

Assistant in Political Science, University of Illinois, 1926-1929

Fellow in Political Science, University of Illinois, 1929-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

CARL WALTHER STROM

FOR THE

Degree of Doctor of Philosophy

Monday, June 16, 1930, 4 p. m.
Room 254, Mathematics Building

THE LIBRARY OF THE
JUN 12 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

- Professor Arthur B. Coble, Chairman
- Professor Henry R. Brahana
- Professor Robert D. Carmichael
- Professor Jakob Kunz
- Professor George A. Miller

OUTLINE OF STUDIES

Major Subject: Mathematics
First Minor Subject: Analysis
Second Minor Subject: Physics

Thesis: ON COMPLETE SYSTEMS UNDER CERTAIN FINITE GROUPS

SUMMARY

The theory of complete systems of invariants for rational functions that are unaltered by the substitutions of a finite group G is an old and well known part of the theory of algebraic equations. Legrange proved that, given any rational function $f(x_1, \ldots\ldots\ldots, x_n)$ that belongs to a finite group G of substitutions on $x_1, \ldots\ldots\ldots, x_n$, every other rational function $F(x_1, \ldots\ldots\ldots, x_n)$ that is unaltered by the substitutions of G can be expressed as a rational function of f and the n elementary symmetric functions, Σ_i, $(i = 1, \ldots\ldots\ldots, n)$. The corresponding problem in the case of polynomial functions of $x_1, \ldots\ldots\ldots, x_n$ has not been solved previously except in the case of the symmetric and alternating groups.

In this paper complete systems of invariants for polynomials that are unaltered by the substitutions of a finite group are studied in the cases of:

1. The cyclic group of order n.
2. Compound groups G of order n whose series of composition

$$G, G_1, \ldots\ldots\ldots, G_m, 1$$

is such that for some $j \leq m$ all the groups

$$G_j, G_{j-1}/G_j, \ldots\ldots\ldots, G/G_1$$

are cyclic.

3. The simple group of order 168.

EDUCATIONAL CAREER

A.B., Luther College, 1919

A.M., State University of Iowa, 1924

B.A., Oxon., 1927

Assistant in Mathematics, State University of Iowa, 1923-24

Rhodes Scholar, University of Oxford, 1924-27

Assistant in Mathematics, University of Illinois, 1929-30

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

MILDRED ELLEN TAYLOR

FOR THE

Degree of Doctor of Philosophy

Thursday, August 7, 1930, 4 p. m.
Room 254 Mathematics Building

THE LIBRARY OF THE
SEP 20 1930
UNIVERSITY OF ILLINOIS

Committee in Charge:

- Professor Robert D. Carmichael, Chairman
- Professor Henry R. Brahana
- Professor Arnold Emch
- Professor Jakob Kunz
- Professor James B. Shaw

OUTLINE OF STUDIES

Major Subject: Mathematics
First Minor Subject: Analysis
Second Minor Subject: Physics

THESIS: A DETERMINATION OF THE TYPES OF PLANAR CREMONA TRANSFORMATIONS WITH NOT MORE THAN 9 F–POINTS

Summary

1. A study of the linear group $g_{9,2}$ and the group $e_{9,2}$ simply isomorphic with $g_{9,2}$, which are associated with the planar Cremona group $G_{9,2}$, gives explicit algebraic expressions for n, r_i, s_j, α_{ji} attached to every planar Cremona transformation with not more than 9 F-points. The expressions depend on 8 parameters $\vee_i$, which are positive or negative integers, and 8 other quantities ρ_i, $\rho_i = 0, 1, 2$ and $\Sigma\rho_i \equiv 0 \bmod 3$. These expressions can be classified into *seven* distinct types.

2. Since the P-curves of the Cremona transformation are Bertini L-curves, then Bertini L-curves with not more than 9 multiple points have the expressions for the order $t = r_i$ or $t = s_j$ and for multiplicities $t_i = \alpha_{ji}$.

3. The subgroup of $g_{9,2}$ congruent to the identity modulo 2, lies in the invariant subgroup $i_{9,2}$ of $g_{9,2}$. For $m > 2$, the invariant subgroup modulo m, lies in the abelian part of the subgroup $i_{9,2}$. Conditions on $\vee_i$, ρ_i are given for $m = 2, 3, 4, 5$.

EDUCATIONAL CAREER

A.B., Oxford College for Women, 1921

A.M., University of Illinois, 1922

Scholar in Mathematics, University of Illinois, 1921-1922

Instructor in Mathematics, Knox College, 1923-1929

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

PAUL HUBERT TRACY

FOR THE

Degree of Doctor of Philosophy

Tuesday, May 27, 1930, 9 a. m.
Room 120 Old Agriculture

THE LIBRARY OF THE
MAY 24 1930
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Committee in Charge:

- Professor Harrison A. Ruehe, Chairman
- Professor Walter L. Gaines
- Professor Merlin H. Hunter
- Professor Oliver R. Overman
- Professor Martin J. Prucha
- Professor Frederic A. Russell
- Professor Nathan A. Weston

OUTLINE OF STUDIES

Major Subject: Dairy Husbandry

First Minor Subject: Economics

Second Minor Subject: Business Organization and Operation

Thesis: THE RELATION OF CERTAIN PLANT PROCESSES TO FLAVOR DEVELOPMENT IN MARKET MILK

Summary

The relation between a number of plant processes and the quality of market milk as indicated by its flavor has been studied. In the absence of more suitable methods the flavor of the milk was determined organoleptically.

One of the most important of the plant processes bearing upon the quality of market milk is the use of an effective grading system. Such a system should provide for bacterial, flavor, and temperature control in the raw milk up until the time of delivery.

The use of chlorin sterilizers on farm and plant equipment should be confined to those of a non-corrosive nature. In no case should the disinfectant be added directly to the milk, and all utensils and equipment treated with chlorin sterilizers should be rinsed with uncontaminated water before adding the milk. Otherwise, unclean, puckery and medicinal flavors may develop.

Milk should not be brought into contact with either iron or copper surfaces. Glass and Allegheny metal have practically no ill effects on milk flavor. Benedict nickel, however, may have a detrimental effect upon milk flavor. The development of a tallowy flavor in milk is closely associated with metal contamination.

Two kinds of flavor defects may occur in milk exposed to sunlight, one a tallowiness, and the other a burnt flavor. Diffused light is an important factor in the development of tallowy flavor in milk, especially that containing an added copper salt.

Pasteurization improves the flavor of most raw milk. Continued heating at 142° F. for over one hour may result in a noticeable cooked flavor.

The odor and flavor of phenol, when present in milk, is greatly intensified by the presence of chlorin added in the form of sodium hypochlorite.

EDUCATIONAL CAREER

B.S., University of Illinois, 1920

M.S., University of Illinois, 1922

Assistant and Assistant Professor in Dairy Manufactures, University of Illinois, 1920-1930

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

SHIRLEY MONROE TROXEL

FOR THE

Degree of Doctor of Philosophy

Wednesday, May 21, 1930, 2 p. m.
Room 456 Chemistry Building

THE LIBRARY OF THE
MAY 24 1930

Committee in Charge:

- Professor Worth H. Rodebush, Chairman
- Professor Reynold C. Fuson
- Professor Thomas E. Phipps
- Professor Ralph L. Shriner
- Doctor Leonard L. Steimley

OUTLINE OF STUDIES

Major Subject: Chemistry (Physical)
First Minor Subject: Organic Chemistry
Second Minor Subject: Mathematics

Thesis: THE HEATS OF DISSOCIATION OF HYDROGEN, OXYGEN AND NITROGEN

SUMMARY

Hydrogen was dissociated in a Wood's discharge tube, and oxygen and nitrogen by means of an electrodeless discharge. The per cent of dissociation was obtained, by applying the laws of diffusion, from the pressures measured on two sides of an orifice, on one side of which there was a varying per cent of atoms and molecules, and on the other side of which all the gas was recombined, catalytically, to molecules. The heat of recombination was measured when liberated by catalytic recombination in a calorimeter.

The heat of dissociation of hydrogen has been determined to be 103,000 ± 7,000 calories per mole. This agrees with the best data from other sources. The heat of dissociation of oxygen has been measured as 163,000 + 7,000 or − 15,000 calories per mole. Several recent determinations from other sources do not agree with this within the limit of experimental error. The heat of dissociation of nitrogen has been measured as 270,000 ± 35,000 calories per mole. This is very probably the energy of dissociation of nitrogen into normal and metastable, excited atoms. The agreement with the best data from spectroscopic studies is satisfactory.

EDUCATIONAL CAREER

B.S., Illinois Wesleyan University, 1926

M.S., University of Illinois, 1927

Scholar in Chemistry, University of Illinois, 1926-1927

Fellow in Chemistry, University of Illinois, 1928-1929

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

TSI YU KAO

FOR THE

Degree of Doctor of Philosophy

Thursday, July 31, 1930, 10 a. m.
Room 162 Chemistry Building

THE LIBRARY OF THE
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UNIVERSITY OF ILLINOIS

Committee in Charge:

Professor Reynold C. Fuson, Chairman
Professor George L. Clark
Professor Duane T. Englis
Professor Charles T. Knipp
Professor Carl S. Marvel

OUTLINE OF STUDIES

Major Subject: Chemistry (Organic)
First Minor Subject: Analytical Chemistry
Second Minor Subject: Physics

Thesis: A NEW METHOD OF RING CLOSURE IN THE CYCLOBUTANE SERIES

Summary

A new method of closure of the cyclobutane ring was suggested by the mechanism proposed by Fuson for the cleavage of α, α′–dibromo–adipic esters by secondary amines. The mechanism of Fuson was as follows: When the α, α′–dibromo–adipic ester was treated with a secondary amine one of the bromine atoms was first replaced by a dialkylamino group which activated the hydrogen atom attached to the same carbon atom and that by elimination of hydrogen bromide a cyclobutane ring was formed; this cyclobutane ring was not stable enough to exist under the experimental conditions and cleaved into two ethylenic compounds.

To demonstrate the possible existence of the cyclobutane ring intermediate the dialkylamino group was replaced by a cyano group which was known to have the activating effect, and it was hoped that this cyano compound, if formed, would be more stable and that it could be isolated and studied. Experiments have verified these predictions. When meso diethyl α, α′–dibromo–adipate was treated with sodium cyanide, diethyl 1–cyano–cyclobutane–1, 2–dicarboxylate was formed. Its structure was proved in the following manner. The cyano ester was treated with boiling barium hydroxide solution to obtain the barium salt. This barium salt on acidification with sulfuric acid gave crude cyclobutane–1, 1, 2–tricarboxylic acid which was converted either directly or indirectly into trans-cyclobutane–1, 2–dicarboxylic acid. This trans acid is identical with the trans-cyclobutane–1, 2–dicarboxylic acid obtained by Perkin's method.

The sodium cyanide ring closure was found to be applicable also to 1, 4–dibenzoyl–1, 4–dibromobutane, which, when it was treated with sodium cyanide, gave 1–cyano–1, 2–dibenzoyl cyclobutane. Its structure was established by a degradation method which, it was hoped, would yield cyclobutane-1, 2–dicarboxylic acid as the final product. The cyano diketone was first converted into the monoxime and this, in turn, into the anilide. The anilide was hydrolized and 1–cyano–1–benzoyl–2–cyclobutanecarboxylic acid was formed. The cyano acid was converted into 1–benzoyl–2–cyclobutanecarboxylic acid by fifty per cent sulfuric acid. Its oxime was made but the Beckmann Rearrangement did not go in the way it was hoped. However, the hydrolysis of 1–cyano–1–benzoyl–2–cyclobutanecarboxylic acid suggested the possibility of hydrolizing the original cyano compound with the same reagent. By so doing a 1, 2–dibenzoylcyclobutane was obtained which was proved to be identical with the low-melting 1, 2–dibenzoylcyclobutane by the reduction of 1, 4–dibenzoyl–1, 4–dibromobutane by zinc dust.

EDUCATIONAL CAREER

Early education in China.

B.S., University of Washington, 1927

M.S., University of Illinois, 1929

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

ERNEST GARDINER WALTERS

FOR THE

Degree of Doctor of Philosophy

Saturday, January 25, 1930, 10 A.M.
Room 176 Chemistry Building

Committee in Charge:
- Professor Worth H. Rodebush, Chairman
- Professor George L. Clark
- Professor Charles T. Knipp
- Professor Carl S. Marvel
- Professor Leonard F. Yntema

OUTLINE OF STUDIES

Major Subject: Chemistry (Physical)
First Minor Subject: Organic Chemistry
Second Minor Subject: Physics

Thesis: THE VAPOR PRESSURE AND THE VAPOR DENSITY OF SODIUM

Summary

An absolute, static method has been devised for measuring the vapor pressure of sodium.

The vapor pressure of sodium has been measured over the temperature range from 650.9° C to 844.7° C.

The equation, $\text{Log. } P = 7.4572 - \frac{5323}{T}$, has been fitted to the vapor pressure data by the method of least squares.

By combining the above data with the measurements of Rodebush and De Vries and Edmundson and Egerton, the equation, $\text{Log. } P = 7.5165 - \frac{5383}{T}$, has been obtained by the least squares method to cover the vapor pressure range from 180° to 845° C.

A dynamic method of determining the vapor density of sodium has been described.

The vapor density of sodium at 705.8° C. was found to be 25 which corresponds to a degree of association of approximately 9 per cent.

EDUCATIONAL CAREER

B.S., University of Illinois, 1926

M.S., University of Illinois, 1927

Assistant in Chemistry, University of Illinois, 1926-1929

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UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

FINAL EXAMINATION

OF

SISTER MARY BERNARDA WELCH, B.V.M.

FOR THE

Degree of Doctor of Philosophy

Thursday, October 9, 1930, 7:00 p. m.
Room 216, Lincoln Hall

COMMITTEE IN CHARGE:

- PROFESSOR ARTHUR HAMILTON, Chairman
- PROFESSOR JOSÉ A. BALSEIRO
- PROFESSOR DAVID H. CARNAHAN
- PROFESSOR THOMAS E. OLIVER
- PROFESSOR WILLIAM S. ROBERTSON

OUTLINE OF STUDIES

Major Subject: Romance Languages (Spanish)
First Minor Subject: French
Second Minor Subject: History

Thesis: ANTONIO PEREZ: A STUDY OF HIS *OBRAS Y RELACIONES*

Summary

The *Obras y relaciones* of Antonio Perez (1534?-1611) rank among the most important productions of the Spanish history and literature of his period. They are of great historical significance, indicating the part he played in directing the destiny of men and of nations. To him must be attributed in great measure Philip II's hostility to Don Juan de Austria which wrecked the latter's promising plan of freeing Mary, Queen of Scots, and ruling with her over England, the loss of the fueros and privileges of Aragon preserved for centuries, the loss of power by the peace party of Spain and the consequent domination by the Duke of Alba with his policy of severity in the Netherlands, the ill-fated expedition of Drake against the Spanish colonies, the attack of Essex on Cadiz, and the bitter antagonism of France and England toward Spain.

The writings of Perez, which present the chief, perhaps the only example of the memoir in Spain during his time, have value not only as autobiography but as a reflection of contemporary events, customs, culture and characters. Forgotten now, their influence has remained. To them chiefly is due the idea of Philip II which has prevailed during the last three centuries, an idea that only modern study has begun to alter in some degree.

As literature the *Obras y relaciones* are to be considered from the standpoint of technique as among the best of Spain's contributions, for they are marked by all the characteristics which the best criticism of the time demanded in a work of literary excellence. Unlimited rhetorical resources, lively imagination, pleasing variety of tone, moving eloquence, adaptability to the occasion, originality of thought and manner, strong graphic power, energy of expression and vigor of language atone for the defects of exaggeration, insincerity, monotony of theme and conceptism.

Perez's influence in literature, with slight exception, can not be measured with any degree of surety, but it is certain that his writings increased the vogue of Spanish literature, encouraged the general trend of French literature, and furthered French interest in everything Spanish. Because of this and because in his *Obras y relaciones* he has exemplified the best writing of his time and gained the right to be named by the Academy among the authorities of the Castillian tongue, he must be considered as worthy of study and worthy of remembrance among the best writers of Spanish literature.

EDUCATIONAL CAREER

A.B., Mount Saint Joseph College, 1913
A.M., University of Illinois, 1927